

DECEMBER

The MOTOR OWNER



PUBLISHED
MONTHLY
PRICE 1/-
DEC. 1919.



The 5-fold-tread that grips the road-bed

Safety Mileage Economy

NO tyre will travel over rough surfaces with greater impunity or give longer life than Goodrich Tyres. The rubber is incomparably tough and resilient and gives the maximum of mileage and comfort in running.

Ask your dealer what he thinks of Goodrich. Try one yourself on one wheel of your car. You will soon have them on all four wheels.

THE famous Goodrich Safety Tread is a design of five bars and a cross-tie moulded into the tread and forms a natural part of the tyre itself. On wet and greasy surfaces this Safety Tread travels right down on the bed of the road not merely on the surface grease. Whatever the angle of the wheels, the formation of this tread offers the greatest possible resistance to side-slip. Skidding is therefore practically impossible on Goodrich Tyres.



GOODRICH

SAFETY TREAD TYRES

THE B. F. GOODRICH COMPANY LTD.,
117-123, GOLDEN LANE, LONDON, E.C. 1.

'Best
in
the
long
run.'

By Appointment

to H.M. the King



Daimler

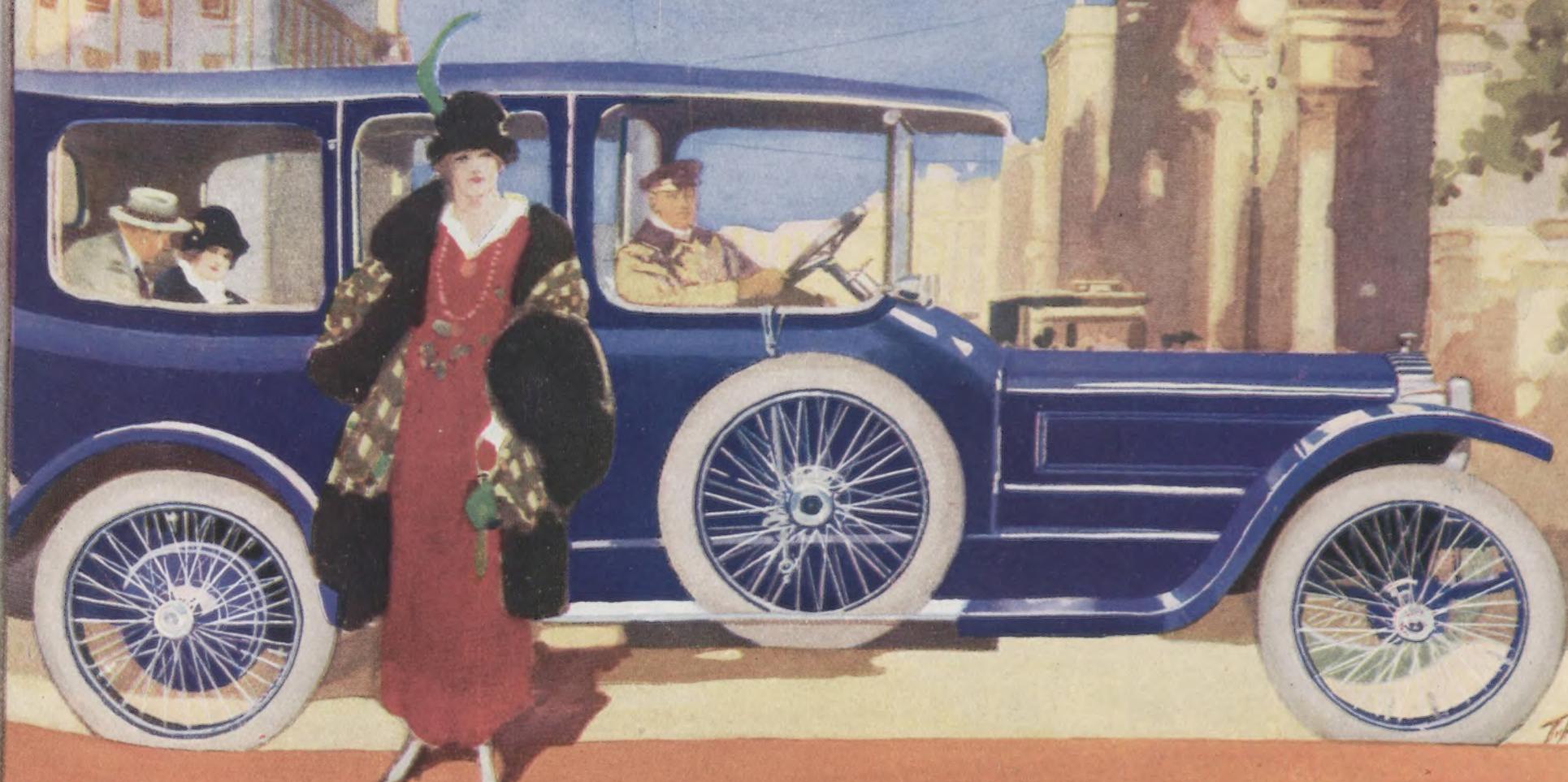
The Representative British Car

30 h.p. and 45 h.p.
6 Cylinders.

The Daimler Company Ltd

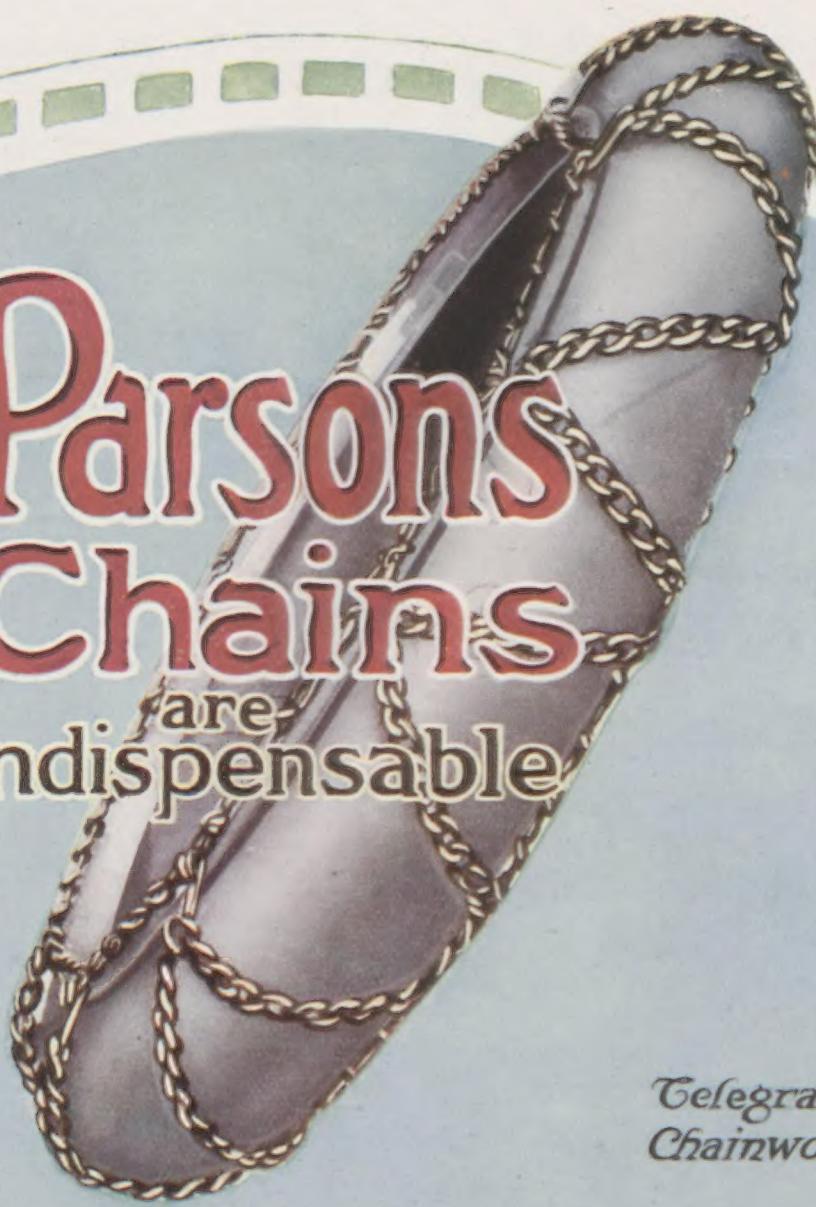
Daimler Works
Coventry :

27 Pall Mall
London S.W.



Parsons Chains

are
indispensable



Telephone:-
Museum 893.

Telegrams:-
Chainwork, London

THE PARSONS NON-SKID COMPY LTD.
23, STORE STREET,
LONDON, W.C.



*Don't allow this to happen
It looks silly - feels horrible &
might cause somebody's death - Perhaps your own.*

Belgravia Bodies



London
Improved
Motor Coachbuilders
Limited

149 Lupus Street
S.W.1
Telephone 3543 Victoria

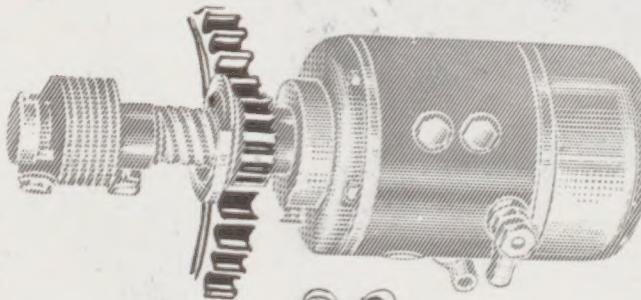
Rotax

"Some Starter"!



Electric Starting &
Dynamo Lighting Equipment
"Makes any Car a better Car"

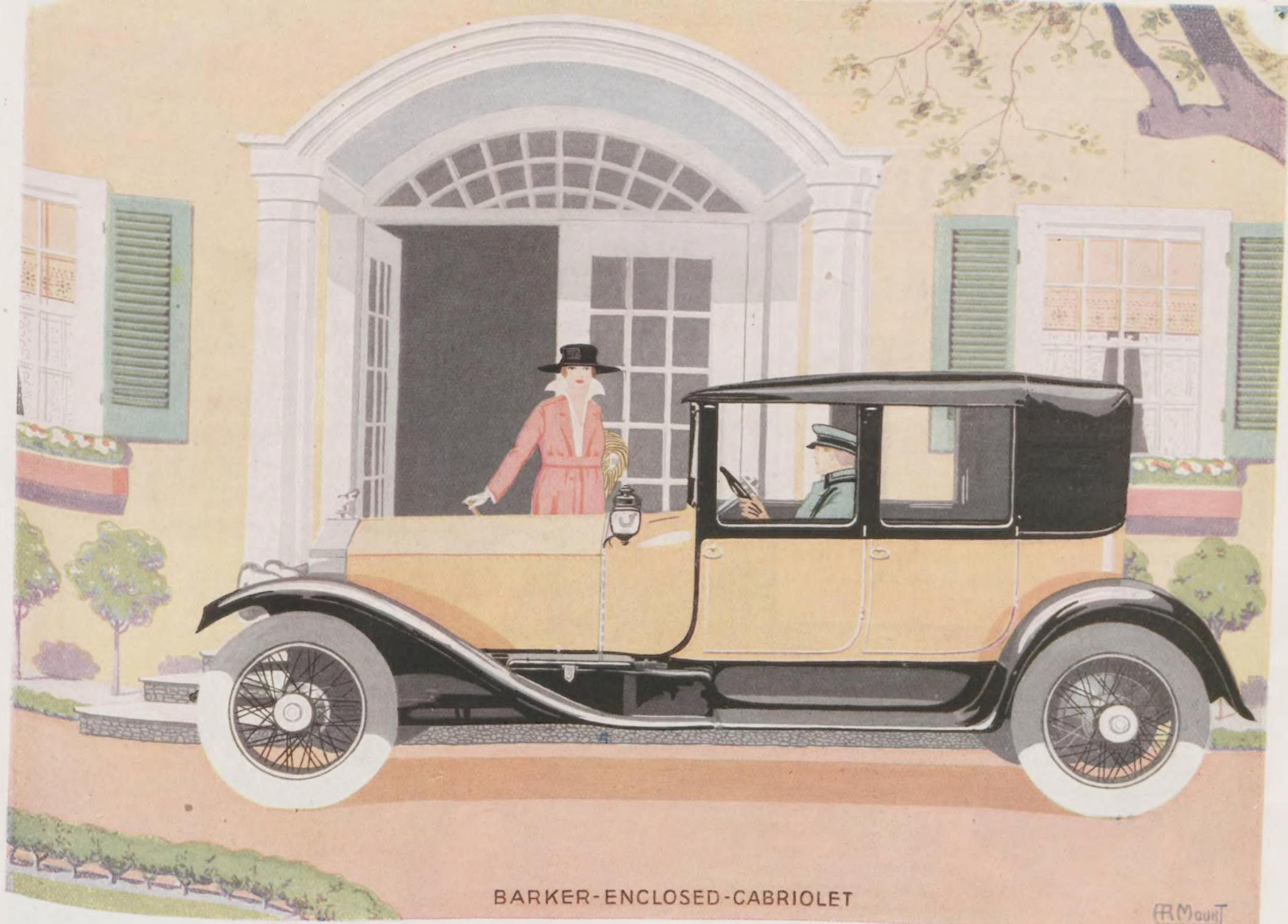
This drawing of the starter shows it with its toothed wheel in engagement with the toothed periphery of the engine flywheel. The engagement is automatically made when the starter switch on the dashboard is operated.



On the engine firing, the starter is automatically thrown out of engagement. Every starter fitted has an ample reserve of power, and has proved equal to the heaviest demands made upon it.

THE ROTAX MOTOR ACCESSORIES
COMPANY LIMITED

WILLESDEN JUNCTION, LONDON,
N.W.10



BARKER-ENCLOSED-CABRIOLET

(R. M. MINT)

200 YEARS OF COACHWORK

IN 1710, when Queen Anne reigned over England, Barkers were the Premier Coachbuilders. Each succeeding reign Barkers built Coaches and Carriages for Royalty and Nobility. They were recognised as supreme at their craft. To-day, Barker & Co. concentrate all the skill and experience thus gained in producing the most luxurious coachwork to be found in the motor world.

BARKER & CO. ARE ROLLS-ROYCE SPECIALISTS,
but build bodies to order for all high-class chassis.

*See "Small" Advertisements in "Times," "Telegraph," and
"Morning Post" every Monday, Wednesday and Friday.*

BARKER & CO. (Coachbuilders), LTD.

Telephone:
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66-68 SOUTH AUDLEY ST., W.I

Telegrams: *Mobilia,*
Audley, London

Angus-Sanderson

Mr. S. F. Edge in the "Auto"

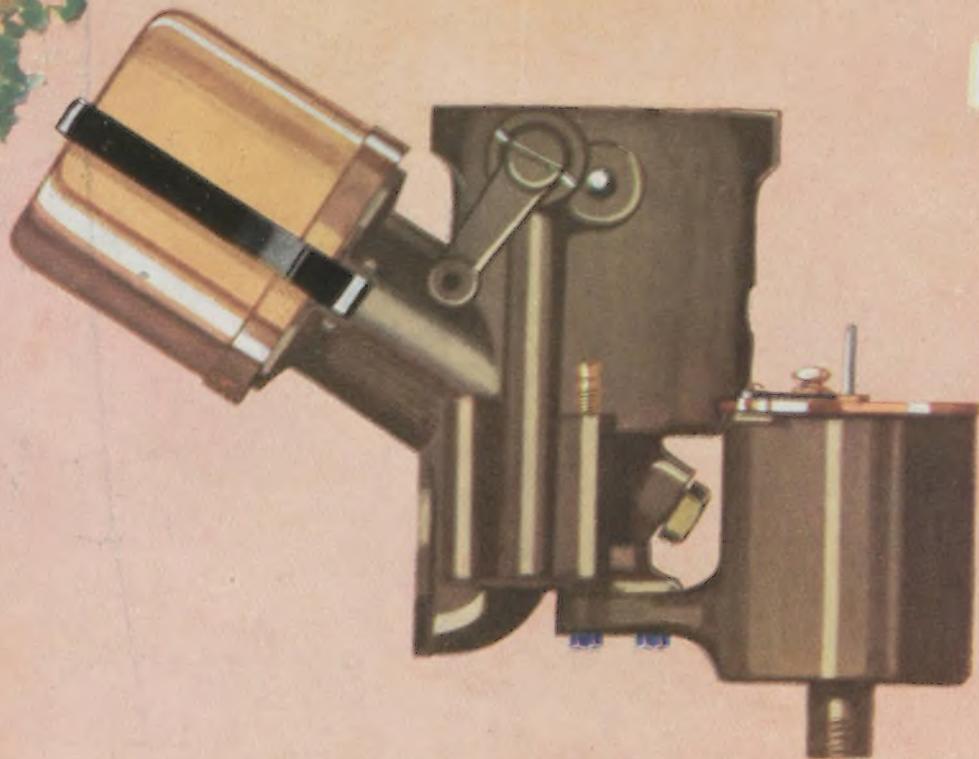
Oct. 23rd, 1919, writes :

"I really cannot remember a more satisfactory ride in a car, of no matter what wheelbase or price. It was emphatically the sweetest-running and best sprung car, judged from the rear seat, in which ever I have been driven. Its suspension was a revelation. This car is a real competitor with the best examples of value for money which America, or any other country, can send us."



SIR WM. ANGUS, SANDERSON & CO. LTD. BIRTLEY, CO. DURHAM

S



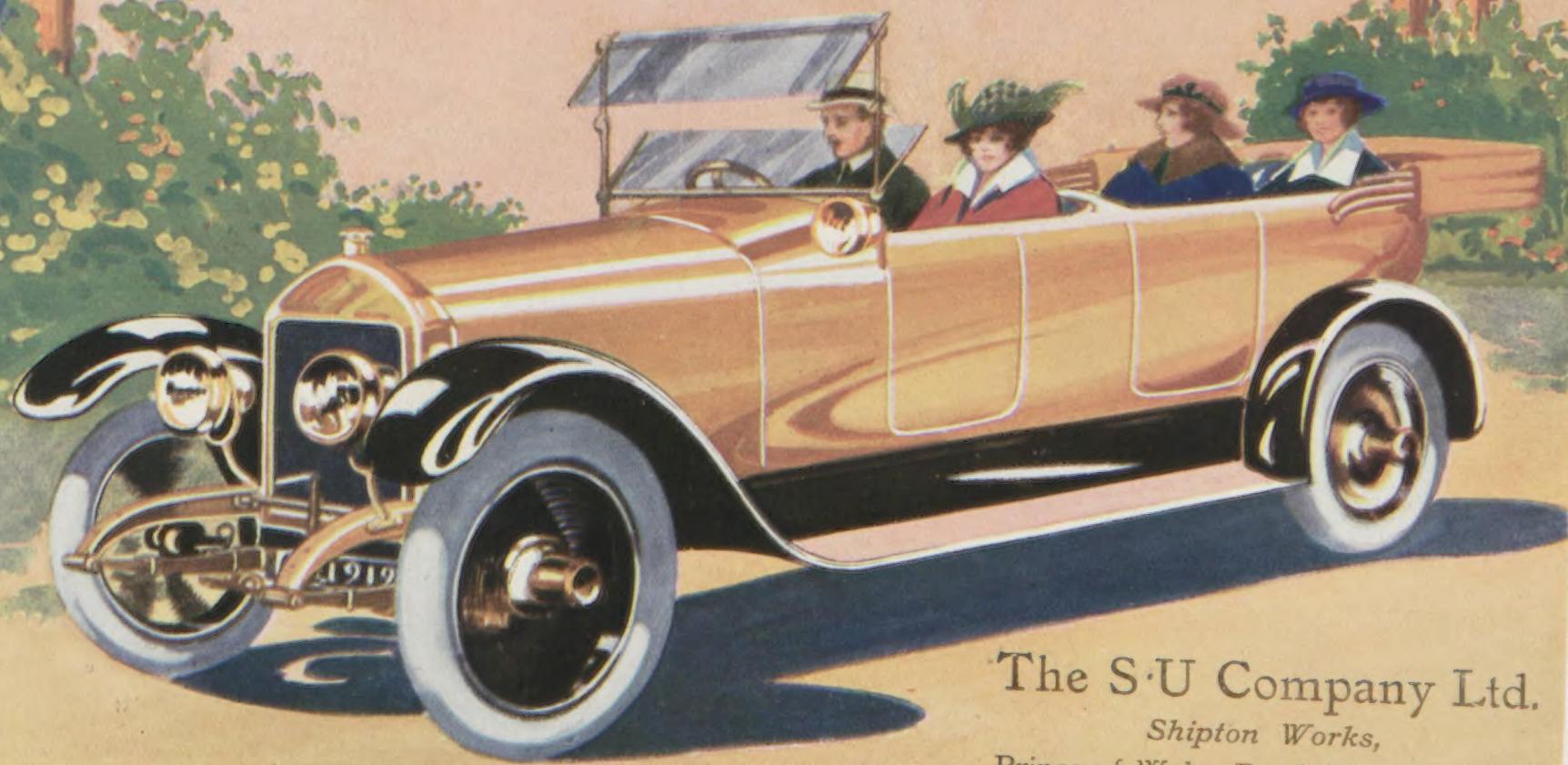
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De Luxe Type

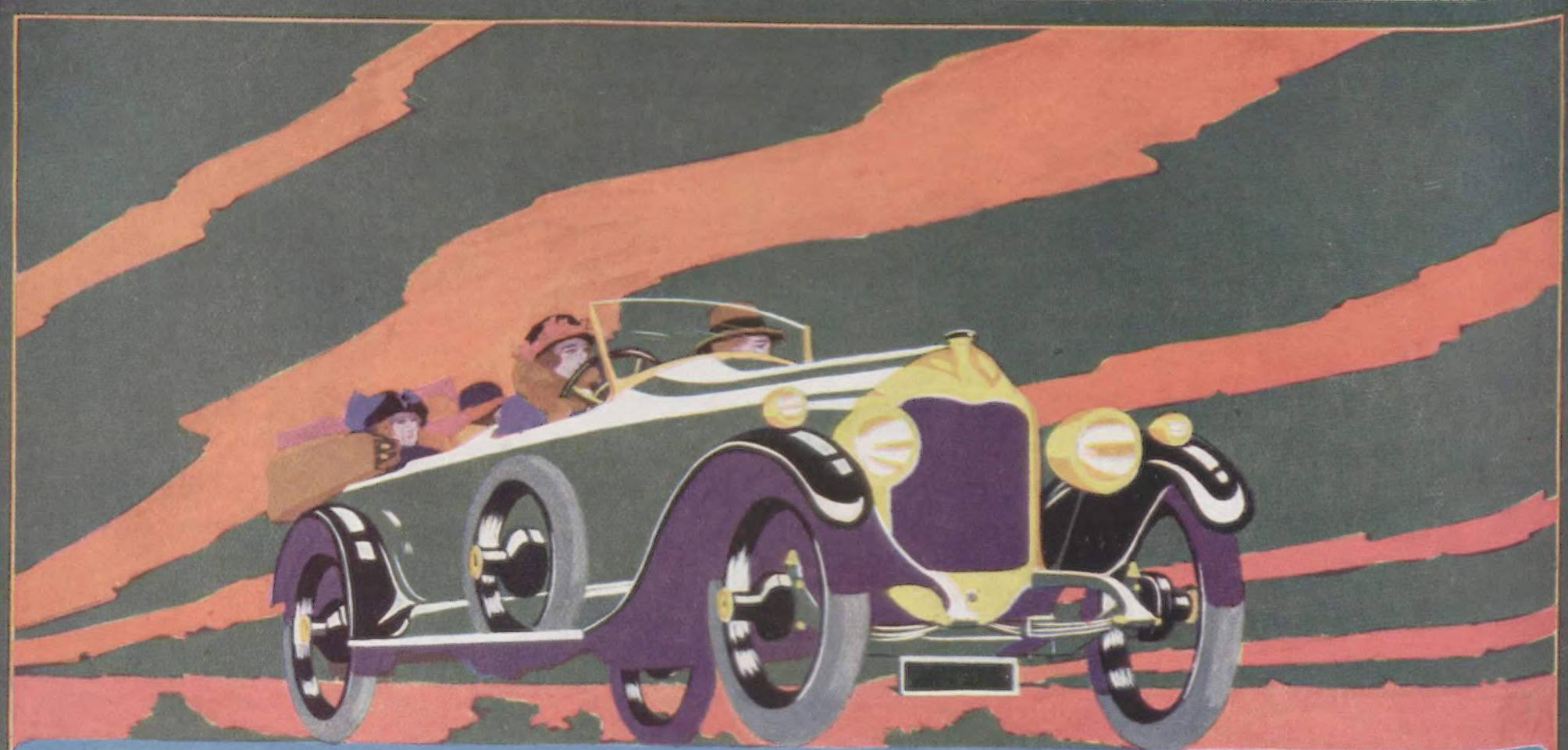
THE Carburetter for the driver who in cold weather appreciates the advantage of immediate starting, driving straight away from cold.

Extreme flexibility, maximum power and economy.

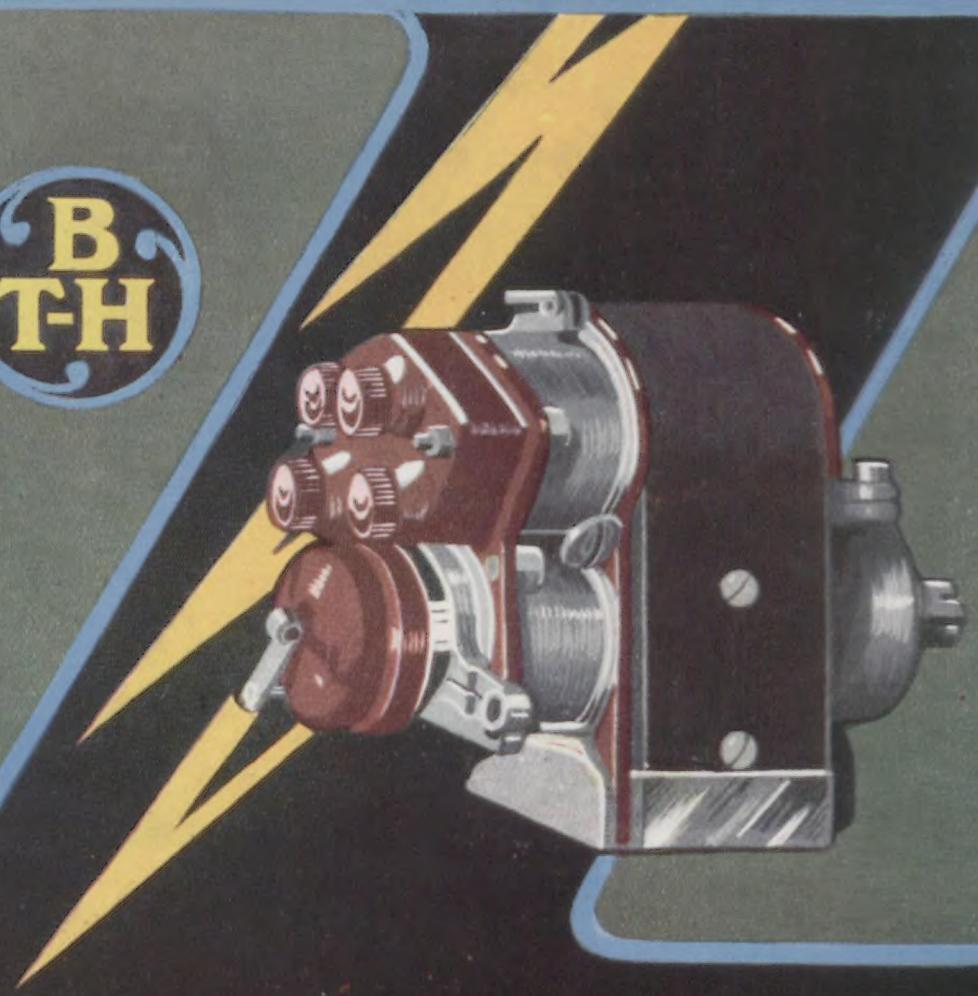
No flat spots at any speeds.



The S·U Company Ltd.
Shipton Works,
Prince of Wales Road, Kentish Town,
N.W.5



B.
T-H



Always Specify

B.T.H Magnatos

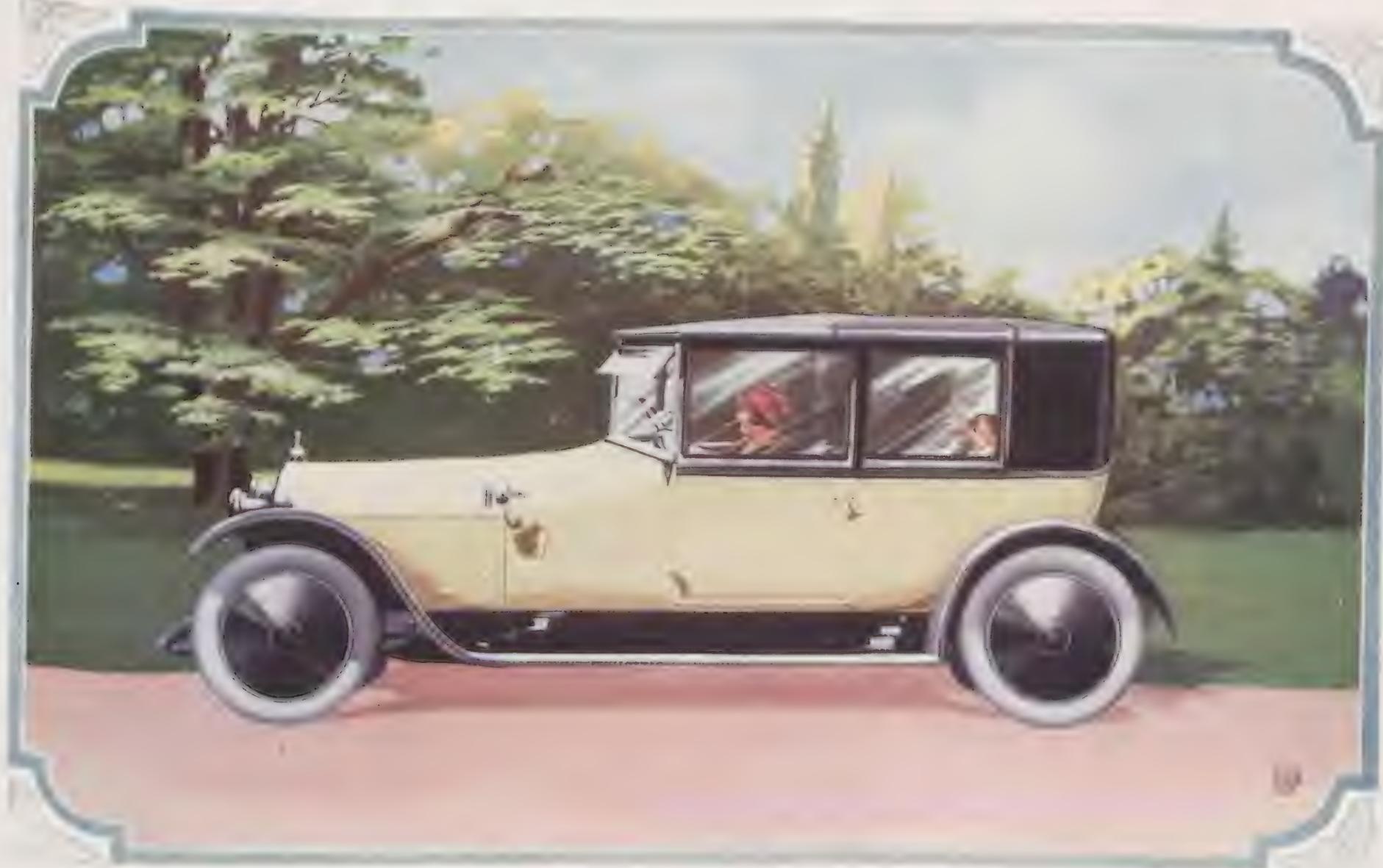
for your ignition equipment

THESE Magnatos, all-British in design and construction, are supplied for three, four, six, eight and twelve cylinder engines, and their successful operation under the severe conditions of aircraft service justifies their being generally accepted as representing the highest standard for quality.

The British Thomson-Houston Co., Limited
Lower Ford Street • Coventry • England

Member of the British Ignition Apparatus Association.

1919



“Quality” Motor Coach Work

In introducing

The “Eclipse” Allweather Body

WE claim from our years of experience in the production of Artistic Body-work to have evolved the *ideal* equipage for the *owner-driver*. This luxurious Body being fitted with sliding Arm Chair Seats is the acme of perfection and comfort. Enquiries will be appreciated, and it will be our pleasure to furnish full Specification and Estimate for supplying the *Eclipse* Body mounted to any make of Chassis.

Our exclusive designs of LIMOUSINE LANDAULETTES, COUPES, and STREAMLINE TORPEDOES submitted on application.

W. H. ARNOLD & CO



“BY ROYAL WARRANT OF APPOINTMENT TO HER MAJESTY THE QUEEN”

Motor Body Specialists and Automobile Engineers

31, YORK PLACE, PORTMAN SQUARE, W.1

And GREAT CENTRAL MOTOR WORKS

Te'ephone : Mayfair 6314

Telegrams : Whacotel, London

11-12 HP **Dawson**



OVERHEAD
VALVES AND
CAMSHAFT

ELECTRIC
STARTING
LIGHTING
& HORN

HELICAL
BEVEL DRIVE

2-3 SEATER

The Car for the Owner-Driver

DAWSON CAR CO., LTD. COVENTRY

PROVISIONAL
PRICES

2-3 SEATER	£475
4-SEATER	£525
COUPÉ	£550
CABRIOLET	£600

ENFIELD

ALLDAY

MADE LIKE

A GUN.

ENFIELD-ALLDAY

10HP Radial
Engine LIGHT CAR



PROVISIONAL
PRICE
£350
Including
Dynamo
Lighting
& Electric
Horn ~

PROVISIONAL
PRICE
£350
Including
Dynamo
Lighting
& Electric
Horn ~

SOME OF THE ADVANTAGES OF THE ENFIELD-ALLDAY RADIAL ENGINE

1. Lightness of weight in proportion to power developed.
Complete car weighs less than 10 cwt., while power developed is over 30 h.p. This saves fuel and wear on the tyres.
2. Almost perfect balance—continuous and steady turning moment.
Preventing vibration and giving a steadiness of propulsion not excelled by the most expensive car.
3. Efficient Air Cooling.
No water circulation to be attended to.

4. Extreme Simplicity.

Of importance to the trained driver and an inestimable boon to the novice.

5. Accessibility.

All adjustments to engine made easily and comfortably from the front of car. No craning over a possibly dirty mud-guard.

6. Low fuel and oil consumption.

In test made on the road, fuel consumption was over 40 miles per gallon, and oil consumption over 2,000 miles per gallon.

Complete Specification on application.

ENFIELD-ALLDAY MOTOR, LIMITED, (Dept. M.O.) SPARKBROOK, BIRMINGHAM

THE

Cooke

SPARKING PLUG

SH
COOKE

The
Best
Plug



WE are continually receiving letters from motorists congratulating us on the efficiency of our Plugs.

To purchase a set of Cooke Plugs means another satisfied user, who is also insured by us free for 12 months against material defects.

We can afford to do this solely on account of the fact that we use only the best materials procurable, and the plug is built on scientific principles.

Send us the name of your nearest Agent.

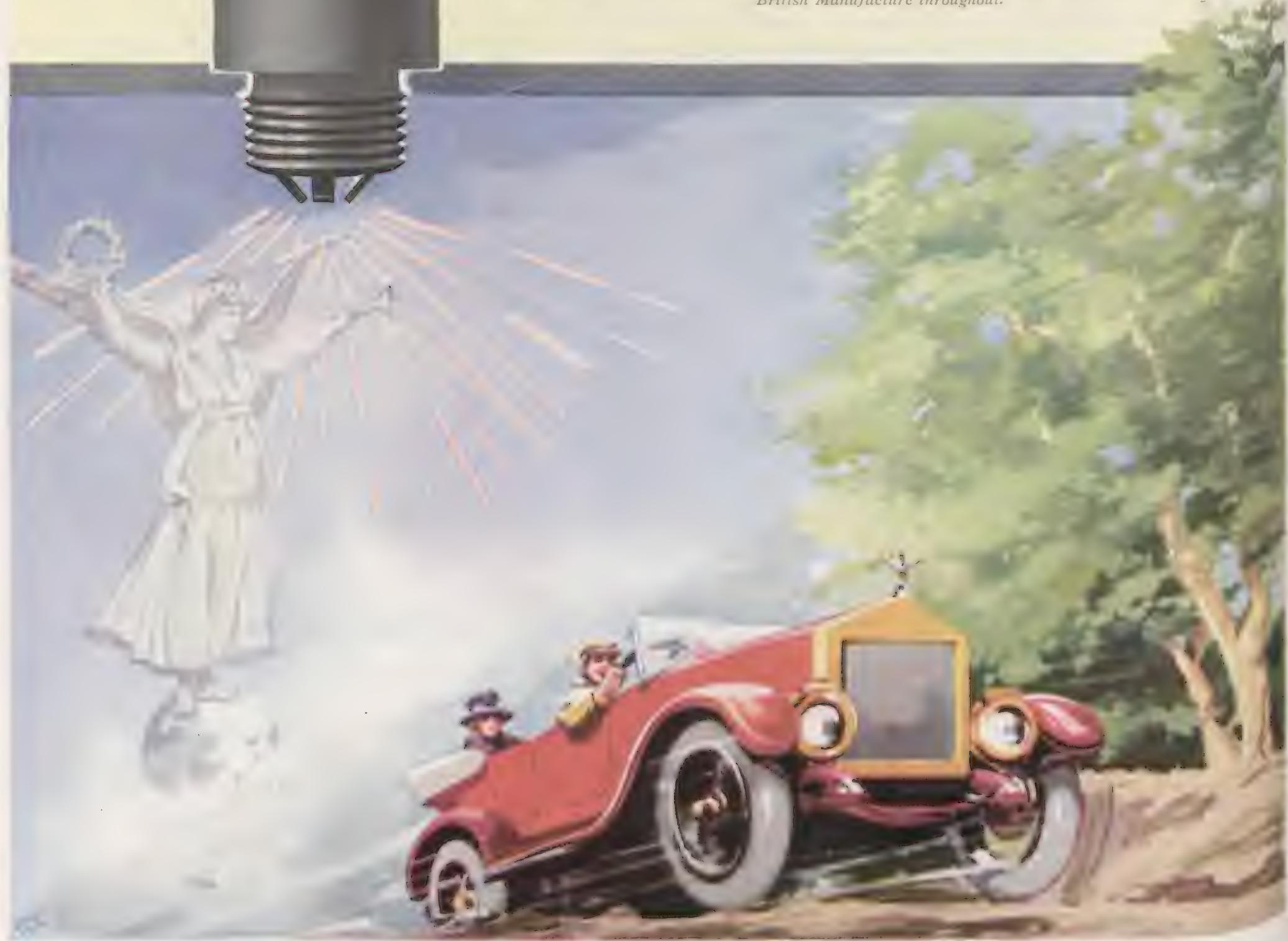
Price 5/- Each

Standard Pattern.

Illustrated Catalogue on application, showing our various types.

HOWARD S. COOKE & CO., Northwood St., BIRMINGHAM

British Manufacture throughout.





The
GRAHAME-WHITE
COMPANY LIMITED

**Rolls-Royce
Specialists**

The Grahame-White Torpedo Body, which is convertible from an open car to a perfectly enclosed car in one minute, was the sensation of the Paris and London Motor Exhibitions.
Prices and Specifications on Application.

LEONARD WILLIAMS
London Manager

12 REGENT ST., PALL MALL, S.W.1

Phones: REGENT 2084 & 829

Any second-hand Car sold by us is subject to examination by R.A.C. or A.A. Bodies of latest design constructed for any Chassis.

Authorised Agents
FOR DAIMLER
LANCHESTER
TALBOT, DELAGE
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ETC., ETC.

Early deliveries of the
above makes can be given

GUARANTEED
TWELVE MONTHS



English built
Coupe £795

English built
Sporting four-seater
£695

PRICE COMPLETE

£ 595

BOOK NOW FOR EARLY DELIVERY

America's Best Light Six

MAIBOHM

TWENTY

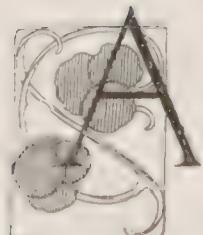
SOUTHGATE LTD.

Sole
Concessionaires
for G.B. & I

Showrooms: 19-21 Heddon St., Regent St., London, W.1

Telegrams: "OMAISOBEME, REG. LONDON."

£625



CAR built largely in the finest Aircraft Material and weighing but $22\frac{1}{2}$ cwt., with oil and water aboard; a car which touches 50 m.p.h. on the level, takes any hill on top gear, and shows a petrol consumption of 25 m.p.g. and an oil consumption of 1,250 m.p.g.



A Car sold complete with body, hood, screen, electric lighting and starting, 5 detachable disc wheels, 5 Dunlop Grooved tyres, and speedometer, at £625—the very remarkable New 15·9 h.p. Arrol-Johnston model for 1920



ARROL-JOHNSTON, LTD., DUMFRIES.

London Agents: Messrs. Leverett,
Thorp & Kearton, Limited,
122 New Bond Street,
W.1

ARROL-
JOHNSTON



3-point Advertising

What it is and where practised

WHERE progress as well as good money is at stake it is necessary to get back occasionally to first principles.

CA manufacturer or merchant trading a line of goods staple to his house needs 3-point Advertising.

1. Advertising that *stimulates* sales.
2. Advertising that *builds* a definite association of ideas round the goods.
3. Advertising that *creates* a buying habit.

CTo achieve 3-point Advertising demands a thorough analysis of the proposition, the definition of the policy to be pursued, and a plan to carry it into effect. It requires experience, the highest competence, and the right organisation. And it pays, whatever the price, to get 3-point Advertising.

CThis is the bold outline of those first principles which have been followed and practised with striking success by W. S. Crawford Limited.

CLet us show the proofs. Give us the opportunity to explain our methods and their application to your particular business

W. S. CRAWFORD Ltd
Advertisers' Agents and Consultants
CAVEN HOUSE, KINGSWAY
LONDON, W.C.2

Telephones : - - - - -

REGENT 5068 & 5069

DOMINION TYRES are Good Tyres



THE DISTANCE

from Canada—to Britain
is well within the mileage given by

DOMINION NOBBY TREAD TYRES

A fast ship takes about seven days to plough through the 3,000 miles of ocean that separates Britain from Canada. Your car, if driven continuously, could duplicate this, and the **treads** would still be sound on your "Nobbies" when you had completed such a journey.

And if you drove a further 1,200 miles, representing the stretch of country from the Canadian Atlantic Coast to Kitchener, Ontario, where Nobby Tread Tyres are made, your "Nobbies" would, under ordinary service conditions, be fit to start the return journey.

Such a performance is well below the average of mileage that users expect from Nobby Tread Tyres—the principal reason why "Nobbies" are regarded as the soundest investment by motorists.

"Nobbies" are probably the most distinctive tyres produced—as impressive in appearance as they are efficient in action. They add something more to the margin of safety under difficult driving conditions—a margin that experienced motorists rely on during the winter months. The Treads are good for the life of the tyre.

If you want the highest expression of tyre service—service that rises superior to every test of travel—buy "Nobbies"—Dominion Nobby Tread Tyres.

PUT THE QUESTION TO YOUR DEALER.

Nobby, Chain & Dominion Tread Tyres are made at Kitchener, Ontario, Canada, by the Dominion Tyre Company, Limited.

INDIA RUBBER PRODUCTS CO., Ltd.

47-48, FARRINGDON ST.
LONDON · E.C.4

LIVERPOOL :
41-55, Wapping

GLASGOW :
18, Bothwell St.



YOUR CAR may be STOLEN

THEFTS of Motor Cars are taking place daily, and increasing. These thefts are cleverly organised and no suspicion is awakened in the mind of a passer-by, who sees a well-dressed man, apparently the owner, nonchalantly starting up a car and driving off in it. Safety devices are being invented by the score, but none baffle the thief who is an expert mechanic, and the modern motor thief usually is an expert mechanic.

YOUR CAR MAY BE THE NEXT !

Lose no time, therefore, in covering yourself against the monetary loss entailed should this happen, or against the expense of repairing malicious damage caused by the thief if his attempt has been frustrated by a safety device.

THE "B.D." 1919 EMPIRE MOTOR POLICY

not only covers the holder against loss by theft (up to the full insured value) and malicious damage, but is also a comprehensive cover in respect of accidental damage, Third Party Risks, Fire, Loss of Motor Coats, Rugs, etc., Medical Expenses, Cost of Towing in the event of a breakdown (this clause has made the Policy known as the "Gets you Home Quickly" Policy), and monetary benefit for personal accident as follows:

Death	£1,000
Loss of two limbs or two eyes	500	
Loss of one limb and one eye	500	
Loss of one limb or one eye	250	

The Policy also provides for return of premium whilst the car is laid up, covers damage or loss of car during transit. Defence in any Police Court proceedings in the United Kingdom in respect of an accident which may be the subject of an indemnity. Bonus for no claim. Reductions for two or more cars. Short period rates and cancellation in the case of owners disposing of their cars.

Write to-day and obtain particulars, post free.
Get your car covered against theft without delay.

**EAGLE STAR &
BRITISH DOMINIONS
INSURANCE COMPANY LTD**

HEAD OFFICE: BRITISH DOMINIONS HOUSE
ROYAL EXCHANGE AVENUE, LONDON, E.C.3
The most Progressive Office for all classes of Insurance.
Branches and Agents throughout the United Kingdom.

ASSETS EXCEED £16,000,000

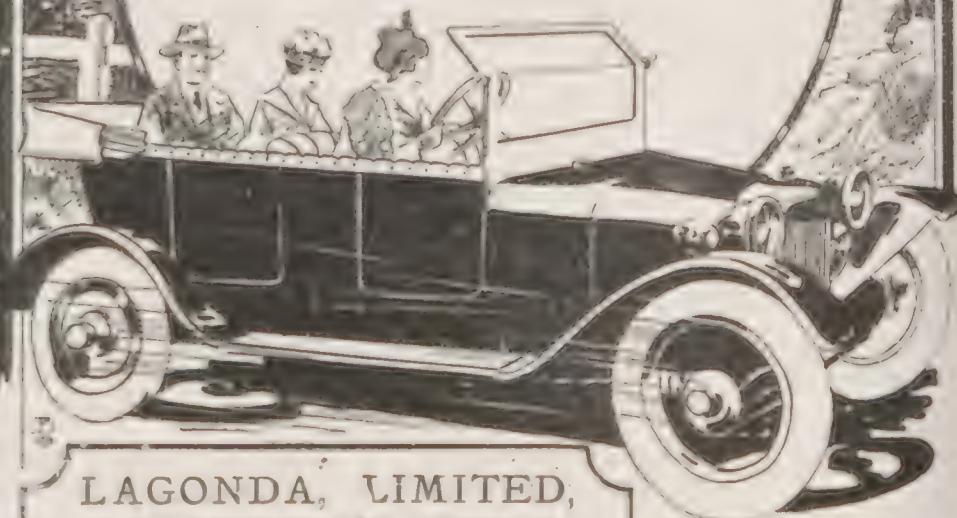
LAGONDA CARS

1920

PROVISIONAL PRICE

Two Seater Coupé Model .	335 Guineas
Four Seater Touring Model	355 Guineas

Equipped with Dynamo Lighting Set, Self-starter, Electric Horn, Spare Wheel and Tyre, Pump, Jack and complete Tool Kit.



LAGONDA, LIMITED,

195, HAMMERSMITH RD., LONDON, W.6

Head Office and Works
Telephone 575 Hammersmith

Staines

Telephone

575 Hammersmith

PRESERVE

THE VARNISH, ENAMEL & LEATHER
WORK OF YOUR CAR BY USING



and prevent Dulling, Pitting, Scratching, and damage by mud, rain, sun, etc. At a cost of a few pence a week, pounds will be saved in renewals.

TRY A 1 lb. TIN 2/6 (POST FREE).

This Polish is made by a British Firm of 66 years' reputation—and is also a brilliant hard dressing for Tables, Desks, Pianos, Parquet and Choice Furniture. Sold by Principal Accessory Dealers & Stores. Booklets Free.

Works: Corner Wharf, Malt Street, Old Kent Road, S.E.1.

Haig & Haig Five Stars Scots Whisky



Home
Bottle



Export and
Home Bottle

We have frequently stated that there would be more Whisky for you when Government took its hand off Control of distribution. Now that control has been removed we are going to make good our promise.

We are going to make good to those who learnt to appreciate our quality in 1916 and 1917; most of all we are going to try to make good to the patriotic men who saved our country from domination by the unspeakable Hun, and who were left out of consideration in the late Control order.

It will not be possible to suddenly re-arrange our methods of distribution. All customers should in the meantime make an effort to obtain supplies through the same channels as they have done during the past three years.

Generally speaking it should very soon be possible to obtain supplies of Haig & Haig Whisky in all the leading Hotels and Restaurants. It may be necessary for you to be *insistent* in making your demand for our brand.

This is more imperative now than it has ever been, because, although Government have freed control, they are still permitting the importation of inferior foreign spirit.

We value our reputation much too highly to tamper with the quality which has brought us fame throughout the world. All houses may not be as scrupulous.

Manifestly there will not be enough Haig & Haig Whisky for everybody; the quantity of our quality is, in the nature of things, limited.

Haig & Haig Ltd. *Head Office: 57 Southwark St London S E 1*



A Popular Xmas Gift at a popular price.

THE Gillette Safety Razor solution to the perplexing Christmas gift-giving problem is one which affords complete and lasting satisfaction to all concerned. The giver knows that in the Gillette the difficult task of selection has fallen on an article of real merit, pleasingly inexpensive, genuinely practical, and one, moreover, which will give everlasting wear.

The man who receives the Gillette as a Christmas offering recognises with instant delight something he can use every day, and which, in its turn, will solve yet another vexing problem—viz., how to be happy though beardless.

The Gillette—the Safety Razor which gives a delightfully smooth, safe, easy and efficient shave in three minutes—will be more popular than ever for Christmas gift-giving this year. There isn't a doubt about it.

SOLD EVERYWHERE.

Gillette Standard Set
(as illustrated above)
21/- Travelling Sets,
including soap and
brush, in triple silver-
plated containers, 30/-
and upwards.

Write for illustrated
booklet, sent free.
**GILLETTE SAFETY
RAZOR, LTD.,**
184/188 Gt. Portland St.
London, W.1.

Gillette
SAFETY RAZOR
NO STROPPING NO HONING



LEAVE IT TO US!

THE ILLUSTRATIONS IN THIS MAGAZINE GIVE SOME IDEA OF THE QUALITY OF OUR PROCESS WORK. PRACTICALLY THE WHOLE OF THE BLOCKS—BOTH COLOUR AND MONOCHROME—WERE MADE BY US. IF YOU REQUIRE REALLY GOOD BLOCKS, OR REPRODUCTIONS BY PHOTOGRAVURE (ONE OR TWO-SIDED) WE SHALL BE VERY GLAD TO HEAR FROM YOU.

THE SUN ENGRAVING CO LTD
MILFORD LANE · STRAND · LONDON

TELEPHONE: GERRARD 117, 118, 119



A Note on Motor Insurance

THE respective merits of various policies cannot be judged by a comparison of Premium Rates alone. The conditions of the Policy, and the reputation for liberal settlement are the paramount factors from the point of view of the Car Owner.

THE "WHITE CROSS" have an unrivalled reputation for the generous settlement of Claims. The Policy is free from all vexatious conditions and has no compulsory Arbitration Clause.

SPECIALLY authorised to issue the R.A.C. Model Policy.

THE WHITE CROSS INSURANCE
ASSOCIATION - LIMITED
5 MOORGATE STREET, LONDON, E.C.
and Branches in all the principal Provincial Towns.

PARTICULARS ON APPLICATION.



St. Edmunds 15



On Tour — In Town

the care-free motorist is he whose car is equipped with Spencer-Moulton Three-Ribbed Tyres.

On the good roads Spencer-Moulton Three-Ribbed Tyres eat up the miles with a maximum of comfort and safety; on the bad roads Spencer-Moulton Three-Ribbed Tyres gallantly survive the ordeals of constant stopping and starting, of unequal steering and uneven surface pressure.

Look for the tyre with the three-ribbed tread—it talks in terms of speed and reliability, of long life and economical service.

SPENCER- MOULTON THREE RIBBED TYRES

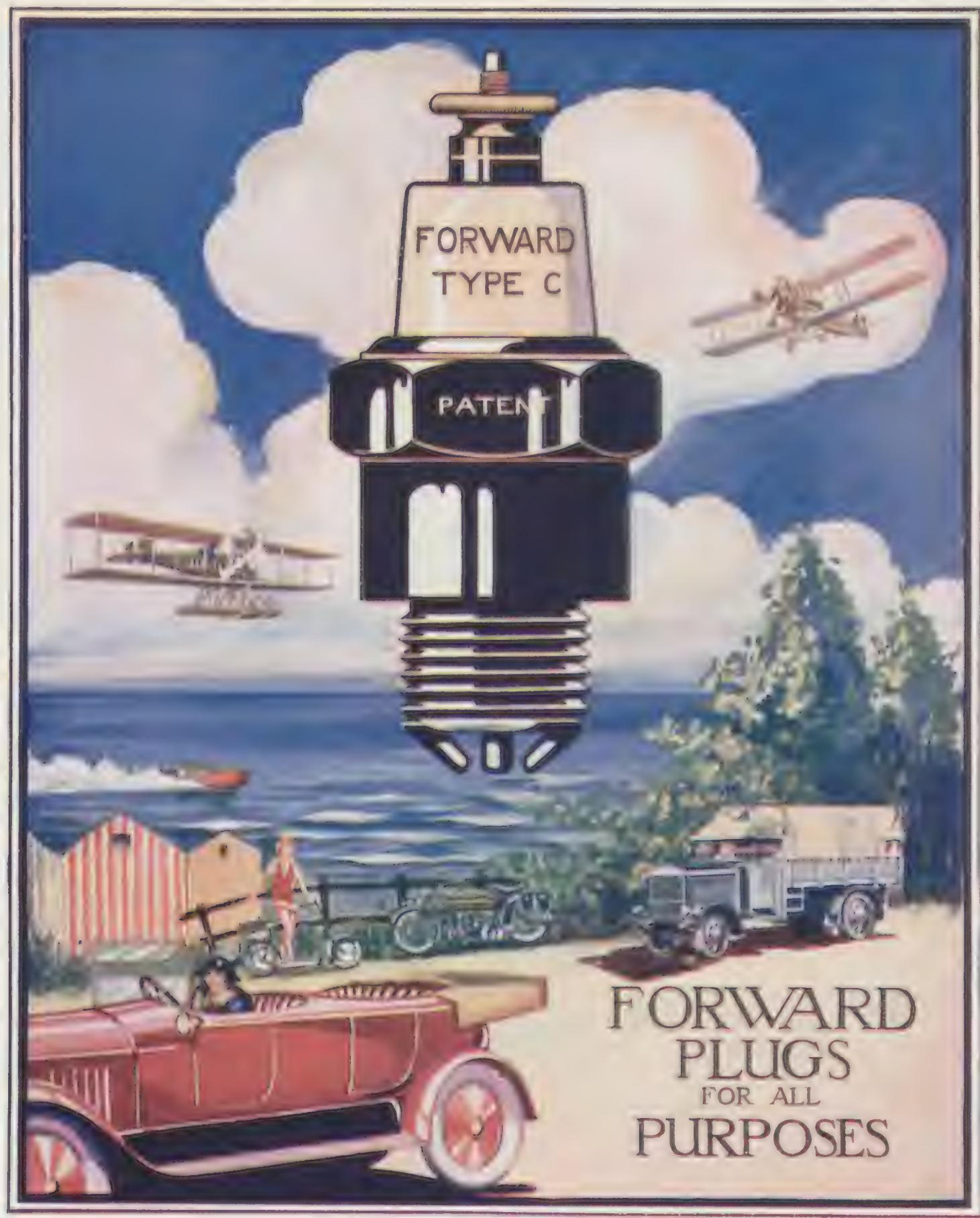
George Spencer, Moulton & Co., Ltd.
and Wood-Milne, Ltd.

42-46, Wigmore Street, London, W.1

Telegrams: "Spenmoul, Wesdo, London." Telephone: Mayfair 6610 (5 lines)

Works: Bradford-on-Avon and Leyland, Lancs.





FORWARD Plugs do not hold their remarkable records for performance just because some lucky chance showed us the way to build better plugs, nor are they practically unbreakable and *positively* leakproof because at some time or other we struck upon a unique method of production. Experience—and experience which covers many, many, years—is alone responsible for their extraordinary durability, strength to withstand shocks that put other plugs out of action, and that efficiency in operation which is so well-known to every Forward user. **C** Be sure you get the particular Forward that is designed for your engine. Our booklet will tell you which model it is.

Forward Sparking Plug Co.
Summer Row Birmingham

THE Lanchester POST-WAR MODEL

A TOUR of the Olympia show revealed nothing more interesting than the Lanchester New "Forty." A Car remarkable for mechanical excellence and refinements. It is the product of men expert in the designing and building of high-grade cars, and the culmination of more than 20 years of successful automobile engineering.

If you did not obtain a descriptive booklet at Olympia, will you write for one now?

THE LANCHESTER MOTOR CO. LTD.,
95, NEW BOND ST., LONDON, W.
BIRMINGHAM & MANCHESTER



"HOUNDS ran into their
fox fifteen miles from
home—

But the car with its built-for-service Dunlop tyres
ate up the miles and we
were home almost before
the light failed."

No tyre trouble to spoil a
good day's sport, because
Dunlop tyres are *always*
satisfactory-in-service.

Dunlop



Marston's High-Class Motor Bodies

Specially selected materials
Experienced Workmanship
Superior designs and finish

Limousines Landaulettes
Cabriolets & Coupés
Sporting & Touring Bodies
to suit any Chassis.

JOHN MARSTON'S
CARRIAGE WORKS LTD.

21 to 28 Bradford Street
BIRMINGHAM

Telephone: Mid. 1776.
Telegrams: "Hansom, Birmingham."



GASTON, Limited

were privileged to show you the renowned

ANDRÉ CITROËN 10
H.P.

Chassis and 4-seater Touring Car at Olympia

Chassis
£445

Touring Car
2-seater £485
4-seater £500

Coupé
2-seater £595
Saloon
4-seater £675
Town Car
£695

May we now call your attention to the

ANDRÉ CITROËN
COMFORT COUPÉS & TOWN CARS

2-seater with extra folding seat, illustrated above,
Price complete with Electric Lighting and Starting

£595

THE EARLY DELIVERY CARS

for Doctors and other Professional Men.

All types are on view at our London Showrooms at:

212-214 G. PORTLAND ST. LONDON, W.1.



20 H.P. 8-CYLINDER
All-British Touring Car

(Tax 6 Guineas)

Exceptional accessibility to all parts.
Automatic Lubrication with oil.
Free Periodical Inspection and
Advice during two years.



FALLINGS PARK, WOLVERHAMPTON

Dunhills Ltd.



ILLUSTRATED on this car are some details of equipment that make for economy in motoring.

LAMP COVERS, TYRE COVERS, HOOD COVERS, SEAT COVERS are all things that protect a better article from the effects of sun, dust, or wet, and for a small outlay save pounds in a twelvemonth.

Even the little step-mat has a similar value, while a pair of dust-proof trunks are as important a touring accessory as any.

Write for estimates and particulars to :

359-361 EUSTON ROAD, LONDON, N.W.1
2 CONDUIT STREET, LONDON, W.1
72 ST. VINCENT STREET, GLASGOW

ACHIEVEMENT

“If British motor engineering were on the decline—which it is not—it would be given a chance of holding out by virtue of the aid which British coach-building lends the sister industry. We have but to look at the products of houses like Cole & Sons to realise the importance of British coachwork in making a market for the British car. A chassis may have all the mechanical merits and refinements, but crown it with a tin-pot body and it looks a poor specimen of a car. Of course it is no use camouflaging a wretched chassis with a beautiful carriage body, as sundry people have discovered to their cost. High-grade British vehicles called for high-grade coachwork, and the home industry has supplied the need. One of the great achievements of Messrs. Cole has been the transformation of the cabriolet from a hideous box to a beautiful vehicle which provides motoring in its most comfortable and most continuous form. To make the closed car a cosy, airy, hygienic, well-lighted and comfortable vehicle, to give it graceful appearance, and withal keep the weight and the proportions reasonable, has been a most difficult task, and Messrs. Cole have taken a leading part in accomplishing it.”

—*Vide THE SPHERE, November 8th, 1919*

WM. COLE & SONS, LTD., 235, HAMMERSMITH ROAD, LONDON, W.6

(Originators of the Cole 4-Seated Coupé Cabriolet)

Coachbuilders to the Royal Family

Prize Medallists
Paris, 1867; London, 1862 & 1873

Telephone
Hammersmith 1413, 1414, 1415



A MERICA'S one great triumph in a mechanically perfect, light-weight, eight-cylindered car is being shipped to Britain in substantial quantities.

In power, freedom from vibration, silence, accessibility and flexibility, the Oldsmobile 1920 meets the most exacting needs of the experienced owner.

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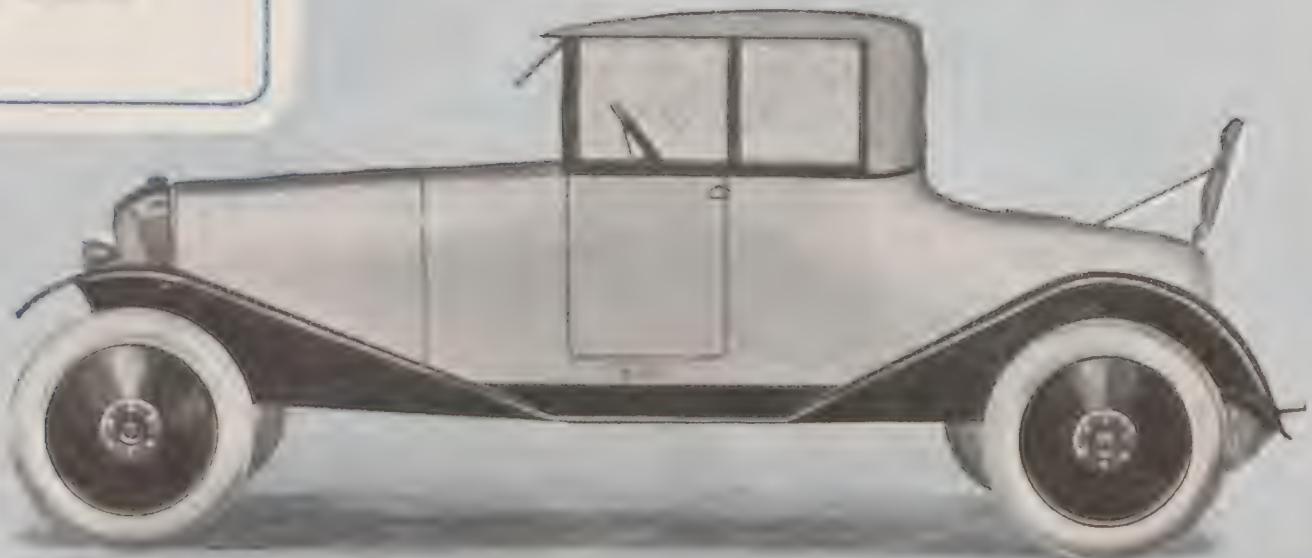
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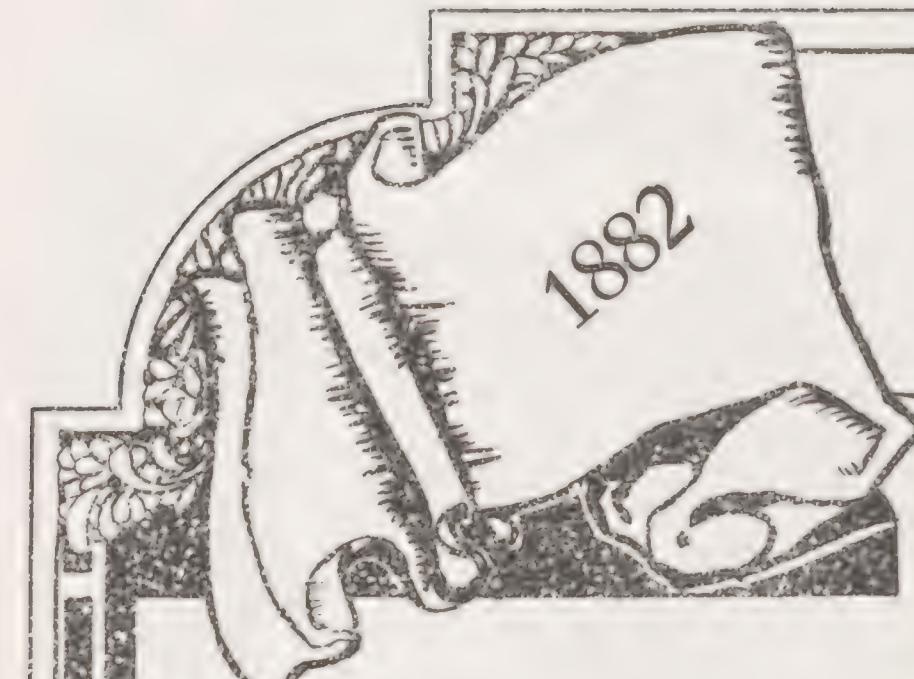


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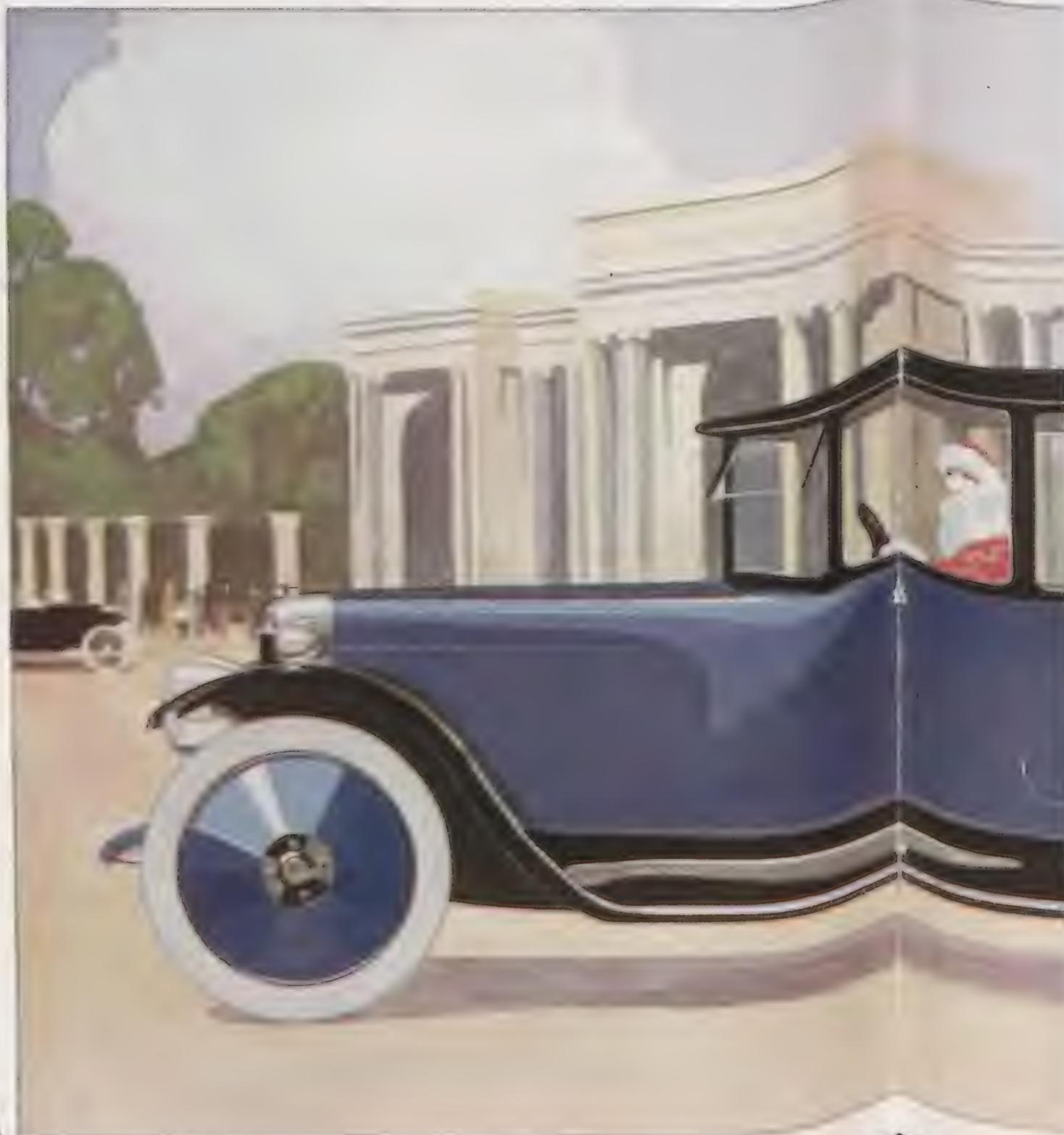
SPECIFICATION

18/20 h.p.—8-cylinder 1920 Model
Chassis (R. A. C. Rating 20·9)
—engine bore 65 mm., stroke
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box in one unit, 3-point suspension,
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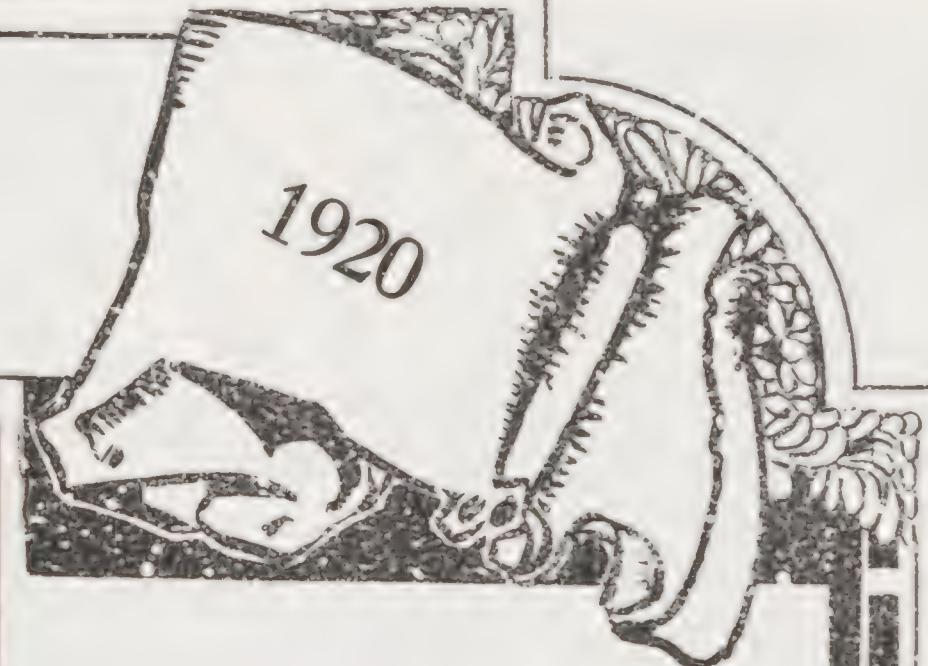


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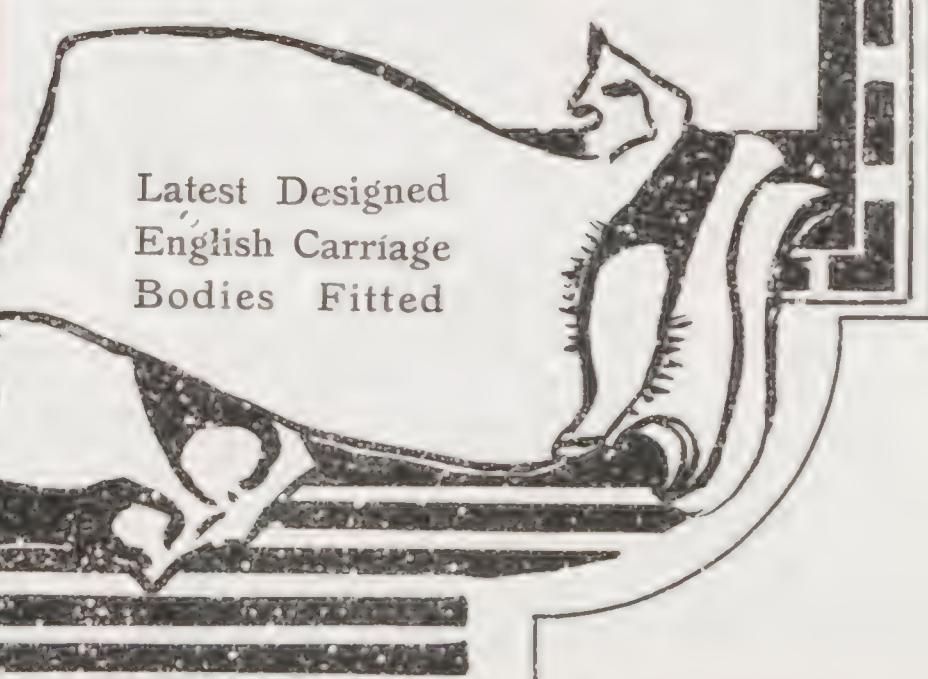
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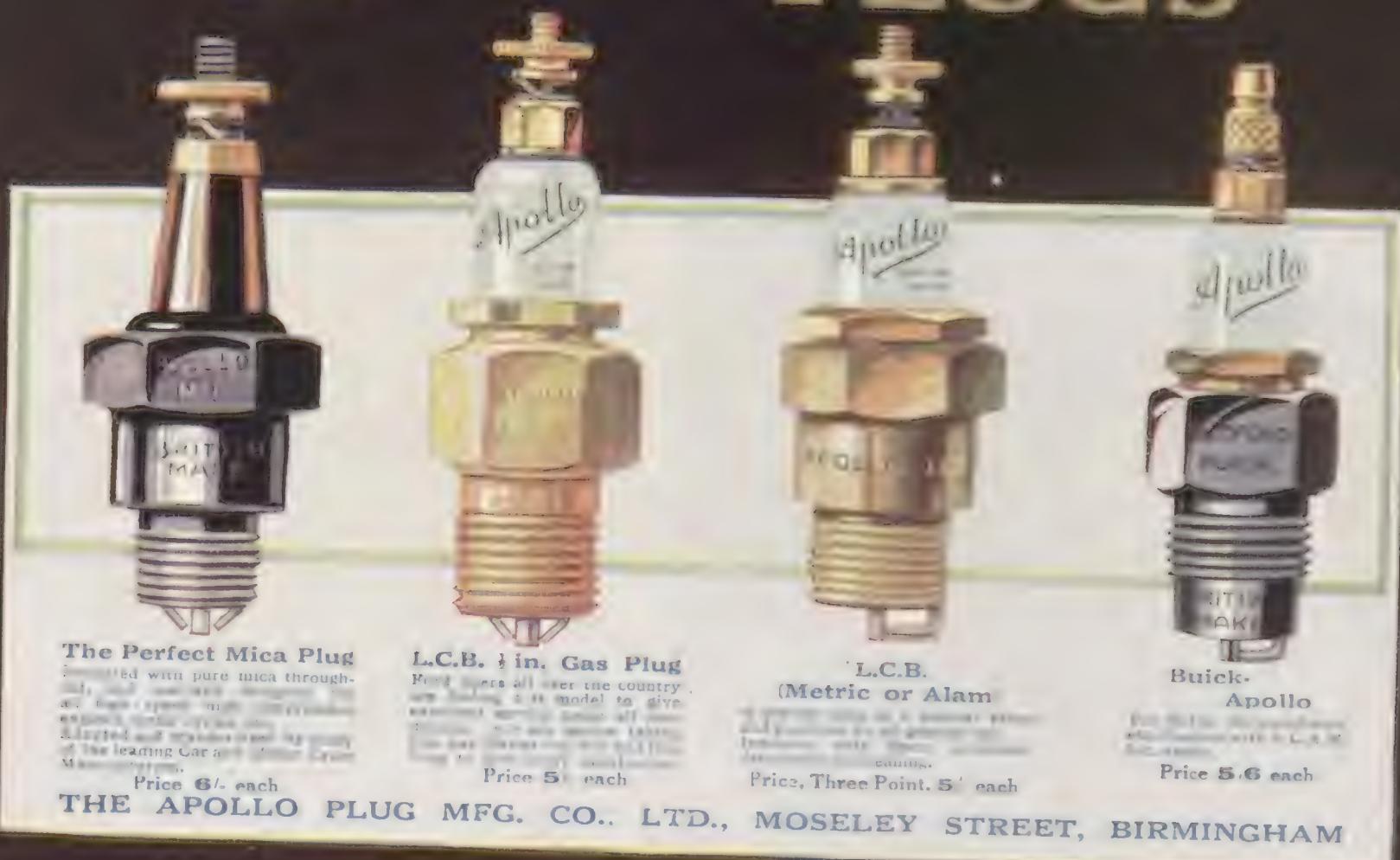
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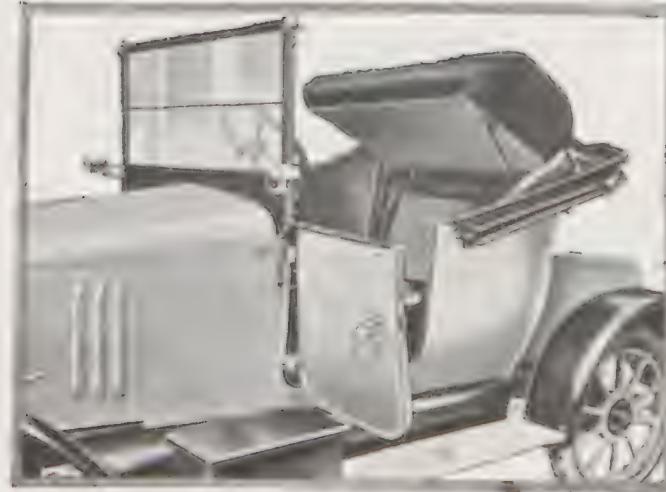
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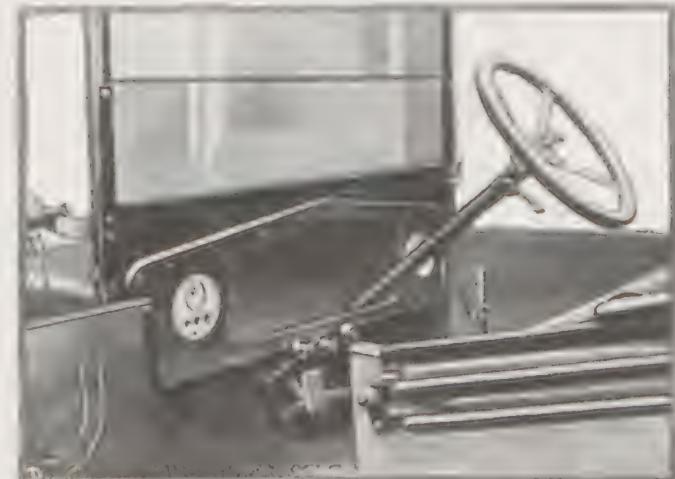
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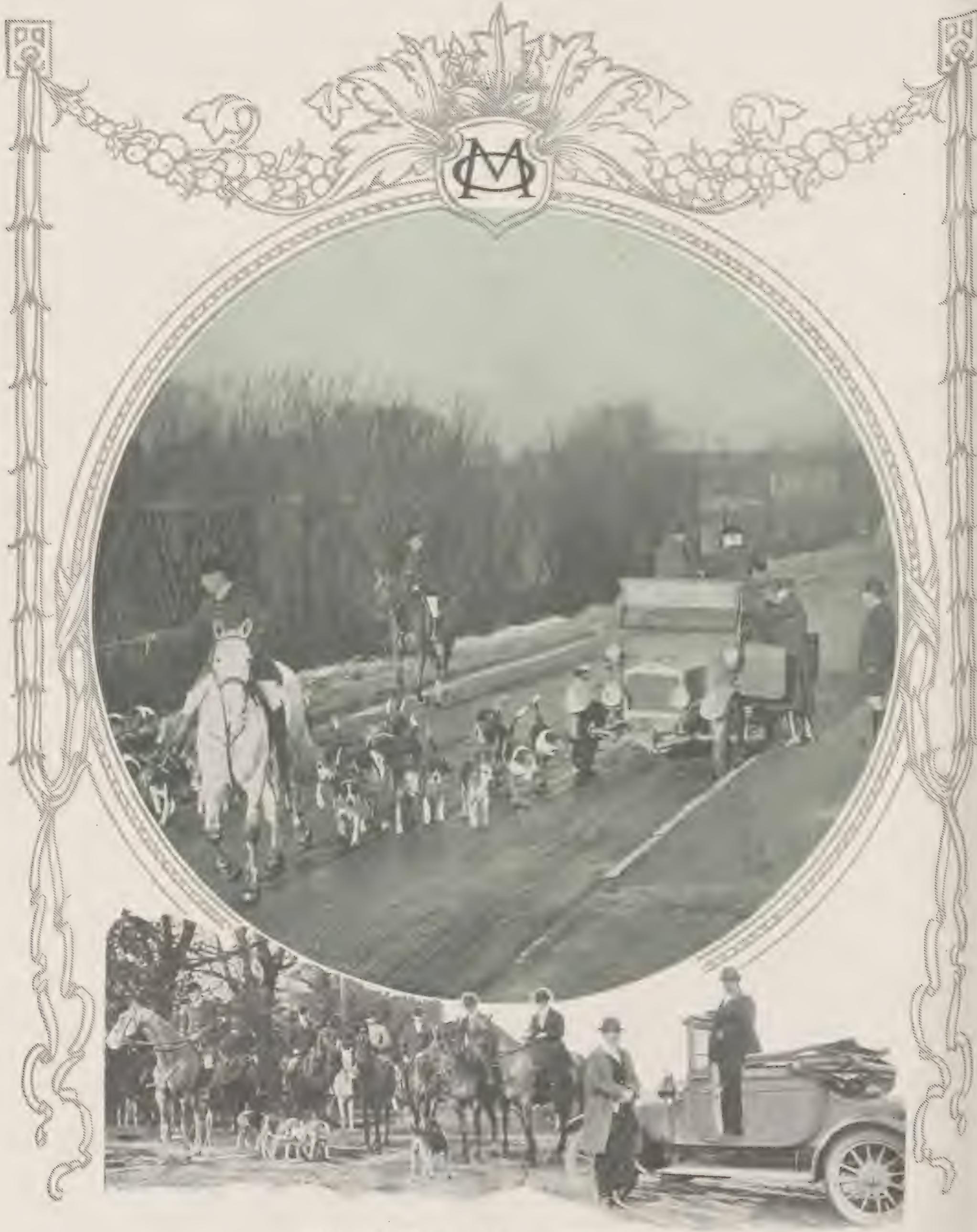


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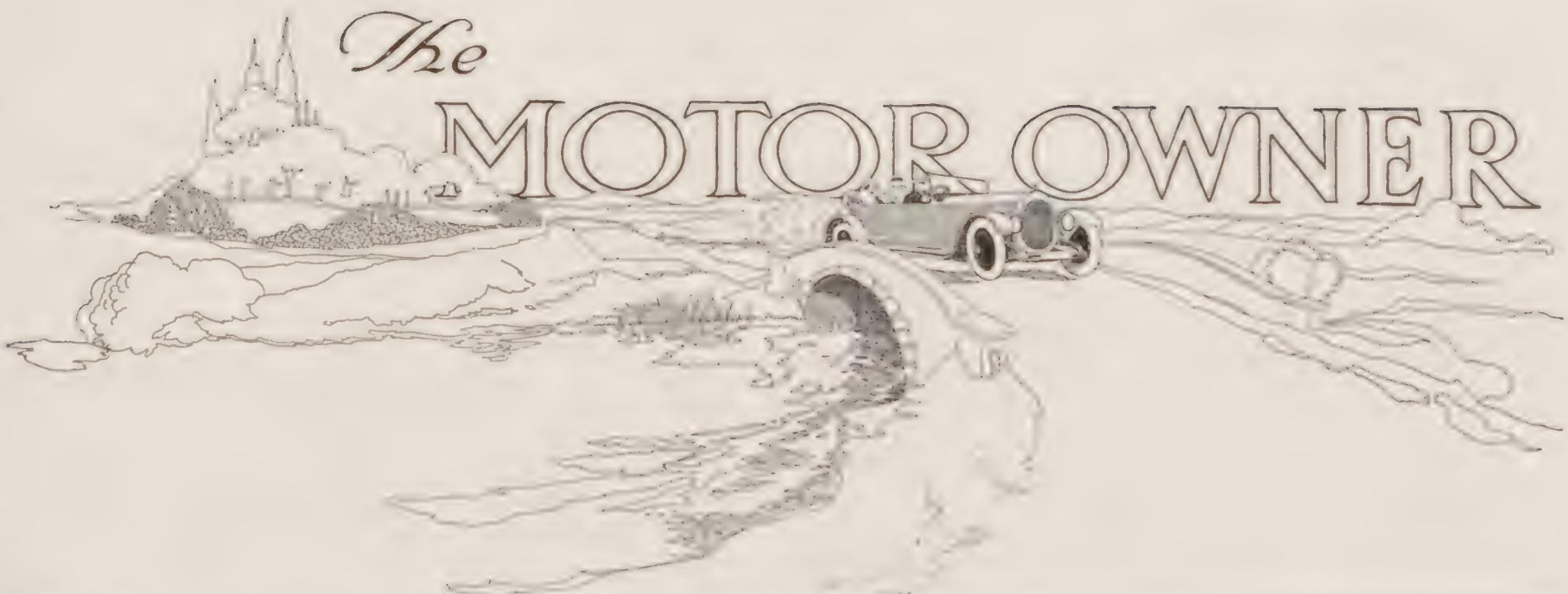
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THE MOTOR AND THE MEET.



Vol. I.

DECEMBER, 1919.

No. 7

EDITORIAL JOTTINGS.

It is no exaggeration to say that

The Impasse. the present situation in the motor-ing world has no parallel in history.

There are scores, if not hundreds, of thousands of people ready and eager to buy new cars, but quite unable to obtain even an assurance of their wants being met for many months to come. During the war, of course, the world went short of many things; but was there ever before a case in peace time of an article of commerce being clamoured for on every side and the supply being utterly unequal to the demand? Olympia offered a joyous spectacle, as a reminder of pristine glories, and it is pleasant to feel that there will be some new cars at all events upon the roads next year; but what with deferred hopes as to deliveries, and an appalling state of things as regards prices, it is to be feared that many of the nigh a quarter of a million visitors left the show in chastened mood.

Who is to Blame?

Meanwhile the newly rich, who alone can afford to buy the most expensive cars and pay premiums for early delivery, are having their innings, while those who have been the backbone of motoring in the past must either content themselves with two-seater cars or do without. For this state of things, if the motor industry were to blame, THE MOTOR-OWNER would not hesitate to say so in no uncertain fashion. Where prices are concerned, we can see no reason why a sovereign should be capable, in

some magical way, of having a greater pur-chasing power in the case of a car than in that of a pair of boots or a pound of jam. Few are the commodities nowadays that are not double their pre-war prices, and many are treble; how, then, is the motor-car to escape the general rise? As for accusations of profiteering —save, perhaps, in individual instances—they cannot be sustained. According to the latest figures, the cost of labour has increased from 148½ per cent. in some departments to 300 per cent. in others, while a 350 per cent. increase in materials is not unknown.

Is it a Class War?

As for deliveries, there can be no question that it is labour, and labour alone, that is to blame. Even the firms that foresaw the need for mass production many months ago have been quite unable to realise their ideals, and on the eve of the Olympia Show itself the very agents of a pioneer "quantity" car were still without their demonstration models. Strikes, partic-ularly that of the moulders which is now stran-gling the entire industry, have been responsible for much, but not for everything. A wrong spirit is abroad, of a kind which found expres-sion in one well-known factory not long ago, when the works manager called the men to-gether, and said that he would pay anything in reason in the way of wages if they would only give him increased production. Immediately a "shop steward" cried out: "We are not going to build cars for the idle rich." And this incident occurred in a factory which produces nothing bigger than a 15 h.p. car!

The Motor a
Necessity.

An observer at the November show, wholly unversed in current problems, and gazing on the brilliant array of cars at unprecedented prices, might easily have thought that they represented nothing if not an orgy of luxury. In very few instances, none the less, had makers produced a higher-powered model than their pre-war type or types, while many had reduced their scale. The cars were no more a concession to luxury than is a post-war loaf of bread, so far as enhanced prices go, and, so far from motor-cars being a luxury, they are more than ever essential to the life of the nation. But so long as labour persists in its present attitude even doctors will be hampered in the performance of their daily tasks, while the middle classes generally will be deprived of a necessary means of locomotion or distribution.

A Fine
Record.

A well-deserved tribute was paid on November 19th to Sir Julian Orde, the Secretary of the Royal Automobile Club, the members of which entertained him to a complimentary dinner on the completion of the work of the Club for officers from beyond the seas. For the greater portion of the war period, and up to September of the present year, the Club was mainly devoted to the use of overseas officers, on a scale of which the general public has probably a very inadequate conception. It may usefully be stated, therefore, that no fewer than 13,806 officers were registered as members, without entrance fee or subscription, between March, 1917, and September 30th last, while just short of a quarter of a million were provided with bed, breakfast and bath. The Royal Automobile Club is now free to resume its normal functions ; but it is only fitting that the above figures should be placed on record as a testimony to Sir Julian Orde's energies and the great services which the Club has rendered to our brethren from across the seas.

Since the last issue of THE MOTOR-
"The Motorist's Friend." OWNER was published the Minister

of Transport, Sir Eric Geddes, has come forward in a new light. At the Olympia banquet he took no small pains to assure his audience that he was an ardent motorist, who had enjoyed the experience of being "police-trapped" on three consecutive Sundays, and he disclaimed the title which had attached

itself to his name—that of a "railway maniac" pure and simple. Anyone, however, can use a motor-car nowadays from motives of convenience without precluding the possibility of having other interests nearer to heart ; but there were other portions of the Transport Minister's address which were not without significance and considerable value. He definitely promised to secure, if possible, the abolition of the speed limit, and also to work for the provision of a better road system. The test of Sir Eric Geddes's motoring affections will therefore be the celerity or otherwise with which he proceeds with these endeavours. Meanwhile it may be noted with satisfaction that he has at last come out into the open with a declaration of policy in lieu of a previously autocratic attitude, and we trust that his newly expressed belief in road transport, kindled doubtless by the part played by motor vehicles during the great railway strike, will be productive—and right speedily—of good and welcome results.

A Quaint
Jumble.

Olympia invariably produces a crop of humours in the way of show reporting, and, *inter alia*, the standard was quite worthily maintained this year by the following delightful jumble from *Vogue* : "In France all is for the extravagance of multiplication, and quite small cars, such as the Landseer (*sic*), are fitted with twelve cylinders." This calls to mind the classic story of Buffon and the French Academicians who were compiling a national dictionary. They submitted with much complacency a definition of the word "crab" as follows : "Crab—a red fish which walks backwards." After glancing at this the great naturalist replied : "Gentlemen, the crab is not red ; it is not a fish ; and it does not walk backwards. Otherwise, gentlemen, your definition is excellent, gentlemen—excellent !" With equal incisiveness it may be pointed out that the car in question is not named the Landseer, but the Lancia ; it is not French, but Italian ; and it is not small, but emphatically high-powered. One may add that France has in no sense been guilty of an "extravagance of multiplication," nor for that matter are there any "quite small" 12-cylinder cars, either British, French, Italian or American.

LIGHT CARS FOR 1920.

By CAPTAIN P. A. BARRON (late R.A.F.).

NEVER before have motor-owners or prospective motor-owners seen such interesting developments in light cars as they will find in the models that have been designed for 1920.

In addition to a very large number of small cars on conventional lines with detail improvements, there are many models that are of special interest because the designers have broken away from convention. In many cases the influence of aero-engines is very noticeable, especially so in the case of the Enfield-Allday light car, which is fitted with an aeroplane type static radial five-cylinder engine which was fully described in the September issue of THE MOTOR-OWNER.

This type of engine was developed by aeronautical engineers on account of its lightness, and because it can be very efficiently air-cooled. A moment's thought will make it clear that much weight can be saved, as a radial engine does not require a long crank-shaft, camshaft and crank-case, and air cooling is effective because each of the cylinders is as fully exposed as those of a V-twin placed transversely in the chassis. It is possible that the introduction of the radial engines into light cars may cause a reaction in favour of air cooling.

Another light car with a radial engine is the C.A.R. This has three cylinders, 75 by 75 mm. bore and stroke, giving 1,000 c.c. The car is a three-seater and is fitted with three speeds and reverse. The final drive is by spiral bevel, and the designers have dispensed with the differential.

After these radial-engined light cars, which naturally attract attention on account of their novelty, one is struck by the fact that the horizontally-opposed twin engine will make a bid for popularity among light car owners in 1920. This type of engine has for many years been much favoured by motor-cyclists, largely on account of its perfect balance and consequent lack of vibration at any speed. Aeronautical engineers have also proved its value, and many designers regard the horizontally-opposed twin as the most perfect type of two-cylindered engine.

The Douglas light car is one of the most interesting of the type. The engine has 92 by 92 mm. cylinders, giving 1,223 c.c., and the nominal horse power is ten. The engine is water cooled, and appears to be a very sound piece of engineering. The car is very pleasing in appearance. It has a special system of helical suspension, three speeds and reverse, and is equipped with a starting and lighting set, a



THE 10-H.P. MERCURY.

feature which should make it very popular among women owner-drivers, of whom there are such a large number at the present time.

The A.B.C. light car is another notable example of those fitted with horizontally-opposed engines, a type which A.B.C. Motors have done much to develop. Like the Douglas, the nominal horse power is ten, though the cubic capacity is slightly lower—1,200 c.c. to be exact. This engine is air-cooled, and it embodies the results of very wide experience with aero-engines. Overhead valves are used, and the entire engine is, in fact, on aero lines. Lubrication is of the dry sump type, with a gear pump on the inside of the timing cover. The gear-box gives four speeds, with ratios from 4:1 to 12½:1, and a reverse, the shaft drive and differential being on conventional lines. The car, fitted with hood, windscreens and dynamo electric lighting set, is a very interesting model; indeed it may be said that it is one of the most interesting air-cooled light cars of the year.

Of similar type is the Palladium. The horizontally-opposed twin engine is air cooled by a forced draught which is proportional to the engine speed and which, the makers claim, will keep the cylinders at an even temperature at all speeds and when running in traffic. The bore and stroke are 89 mm. by 107 mm., giving 1,331 c.c., the pistons are of aluminium alloy, and the valves of exceptionally large diameter. A friction drive has been adopted. Of light cars fitted with this type of transmission it is proposed to

say a good deal later, the friction drive being one of the notable features in the design of light cars for 1920.

A newcomer with horizontally-opposed engine is the Coventry-Victor Motor Company's small car, which really comes into the cyclecar class.



THE 10-H.P. DAY-LEEDS.

The new Rover light car is certainly one of the most interesting of those fitted with the horizontally-opposed air-cooled type of engine. A notable feature is that the clutch and gear-box are incorporated in the power unit. A dummy radiator of the Rover shape is fitted, and efficient air-cooling is assured by allowing the heads of the cylinders to project through the bonnet.

We may now glance at the light cars that have a friction drive, and it will be seen that a large number of designers have become converts to this system. This drive has been made popular by the success of the G.W.K. light car, which

has held a high place since the beginning of the movement in favour of small cars of comparatively low price and having low petrol consumption. For a time there was a certain amount of prejudice against the friction, or disc drive, as it is often called, but it is evident that it has died a natural death.

For the benefit of those who are buying a light car for the first time, it may be said that the friction drive abolishes the gear box. In its simplest form it consists of two discs at right angles, and the different ratios, or "gears," are obtained by moving one disc between the centre and the circumference of the other. The reverse is obtained by moving the disc that takes the drive across the centre of the engine-driven disc.

The G.W.K., which was well known as a two-cylinder light car with its engine placed in an unusual position behind the seats of the

1.—The 10-15 h.p. Fiat. 2.—The 10 h.p. Calthorpe. 3.—The 10 h.p. Wolseley. 4.—The 9·5 h.p. Standard.



driver and passenger, has now become a four-cylinder car with the engine in the orthodox position in front. Most people will think that its appearance has been much improved. Two and four-seater models are made, and a dynamo lighting set is fitted to the standard models.

A new light car for 1920 is the Grahame-White, which has a friction drive of novel design. Instead of being of the simple two-disc form, there are in this case two friction discs besides the flywheel which forms the driving disc. On any gear except the top the drive is from the flywheel to the friction disc set at right angles to it, and thence to the second friction disc, which slides on the propeller shaft, and is of course at right angles to the first friction disc but parallel with the flywheel.

The advantage of this arrangement is that it gives a direct drive on top gear, as the first driving disc is then thrown out of action, and the second engages by means of a clutch with the flywheel and revolves with it. This direct drive on the top gear is undoubtedly a good point, and, although the system may sound complicated, it is in reality very simple. The Grahame-White light car is fitted with a four-cylinder Dorman engine and the chassis is on standard lines.

The H.F.G. is another friction-driven light car with an air-cooled engine of 1,244 c.c., giving nominally



THE 12 H.P. ALBERT.



THE 12 H.P. A.B.C.



THE 10 H.P. C.A.R.



THE 10-16 H.P. HAMPTON.



THE 8 H.P. LITTLE MIDLAND.

10 h.p. Other examples are the Milton, water-cooled, and the Richardson, air-cooled, both of which have a friction drive but final chain transmission, and belong to the cycle-car class. The G.N., on the other hand, is a car with a cardan shaft, combined with a final chain drive.

Two light cars that have aroused a great deal of interest are the new six-cylinder A.-C. and the eight-cylinder Duplex.



THE 10 H.P. DOUGLAS.

The A.-C. six-cylinder engine shows evidence of aircraft influence. It has an overhead camshaft, and is very cleanly and cleverly designed. The bore and stroke are 56 mm. by 100 mm., giving 1,477-8 c.c. The engine is water-cooled, and a pump is fitted at the forward end of the camshaft. The transmission system and springing have been improved, and the body has been made more attractive. A dynamo lighting set is fitted.

The eight-cylinder Duplex will be one of the most discussed light cars of the year. The eight cylinders do not require eight sparking plugs, as they are coupled into four pairs and only one plug is required for each pair.



THE 12 H.P. 6-CYL. A.-C.

Sleeve valves have taken the place of the conventional poppet type. The gear-box gives three speeds and reverse, and the final drive is by helical pinions.

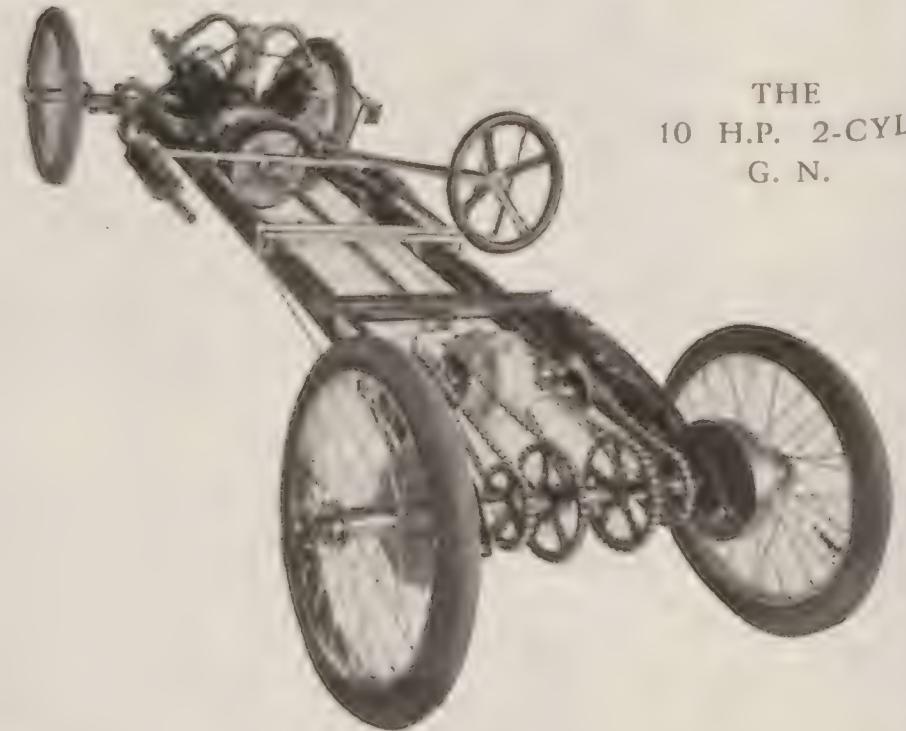
Having now dealt with some of the outstanding features in light car design for 1920, we may make a rapid review of old friends and newcomers on more conventional lines.

The deservedly popular Singer has not been altered

appreciably for 1920, though improvements have been made in the windscreens and hood. The Calthorpe is another favourite that has made its appearance without any great alterations. The sporting models are fitted with the new Sankey steel disc wheels. The enclosed propeller shaft has been abandoned in favour of an open one, and the oil pump has been improved. The Standard is another light car that has proved so satisfactory that the makers have not introduced any important changes. The wheelbase has been lengthened slightly, and this improves its appearance.

The Day-Leeds is another well-known light car on lines that experience has proved to be sound. It has a four-cylinder engine, three speed and reverse gearbox and orthodox car transmission. The same remarks apply to the Deemster, a soundly designed light car which has a mechanical starter operated from the seat and a Rotax dynamo lighting set. The Hampton has a Dorman engine with overhead valves and is of pleasing design throughout. It has an electric starter and lighting equipment.

The Lagonda for 1920 has a new type of radiator, but most of the well-known and well-tried features have been retained. The Mercury is another of the many successful four-cylinder light cars, and is fully equipped with Smith



THE
10 H.P. 2-CYL
G. N.

dynamo, spare wheel, hood, screen, etc. The Meteorite has a Coventry-Simplex engine and the orthodox gear-box and transmission. A C.A.V. lighting set is fitted. This well-known electric outfit also appears on the Wilton light car, which is notable for the width of the seating accommodation. Three people can sit comfortably in the seats usually provided for two, and a fourth may be carried on a dickey seat.

Few changes have been made in Marlborough cars for the new season. One of the most notable is that the bore has been increased by 2 mm. in view of the fact that the addition of an electric lighting and starting set calls for slight extra power—both because the dynamo requires to be driven, and for the reason that extra weight has to be carried. The engine capacity is 1,287 c.c.

The Eric-Campbell is another light car with 1,498 c.c. Coventry-Simplex four-cylinder water-cooled engine, and conventional car transmission, dynamo lighting and Sankey detachable wheels—a thoroughly sound specification. The same remark applies to the Autocrat, which has a four-cylinder engine and an electric lighting and starting set. In this class also should be mentioned the 10 h.p. Ashton.

The Aston-Martin and the Airedale have features that

are departures from common light car practice, as they are both fitted with four speeds and reverse. The same feature is found on the Italian F.I.A.T. light car, the French Peugeot light car, which has for years been very popular in this country and is likely to be more so in 1920, and the British S.H., which, besides being equipped with four speeds and reverse, is supplied with dynamo lighting and starting set.

A new Briton light car has a four-cylinder engine of 1,372 c.c. and an engine starter, lighting set and spare wheel.

The 10-16 h.p. Marlborough.



The 8 h.p. Bayard



The 11 h.p. Riley.



The 10 h.p. Charron-Laycock.

SOME CHARACTERISTIC EXAMPLES OF LIGHT CARS FOR 1920.

The Phoenix is yet another of the four-cylinder type, and an interesting feature is that the steering rake, clutch and brake pedals are all adjustable, both as to height and angle, a point that will appeal to drivers who are not of "stock sizes." C.A.V. dynamo lighting and starting has been adopted.

Other interesting light cars with which it is not possible to deal as fully as one would wish are the Secqueville-Hoyau, which has aluminium pistons, tubular connecting rods, automatic ignition advance, and a 12-volt Le Rhone

combined starter and dynamo; the Charronette, which has a sound specification, including C.A.V. starting and lighting; and the Citroën, a new French light car of the four-cylinder water-cooled type, produced on quantity lines.

An interesting newcomer is the Beardmore, made by the well-known Glasgow firm that took so great a part in the aeroplane industry during the war. It is a four-cylinder light car with an engine of 1,487 c.c. The gear-box and transmission are on conventional lines, and the car is fitted with C.A.V. starting and lighting sets.

The 12 h.p. Albert.



The well-known Stellite has been superseded by a new light car to be known as the Wolseley Ten. It is a two-seater, with an engine of 1,261 c.c., and is fitted with a B.L.I.C. starter.

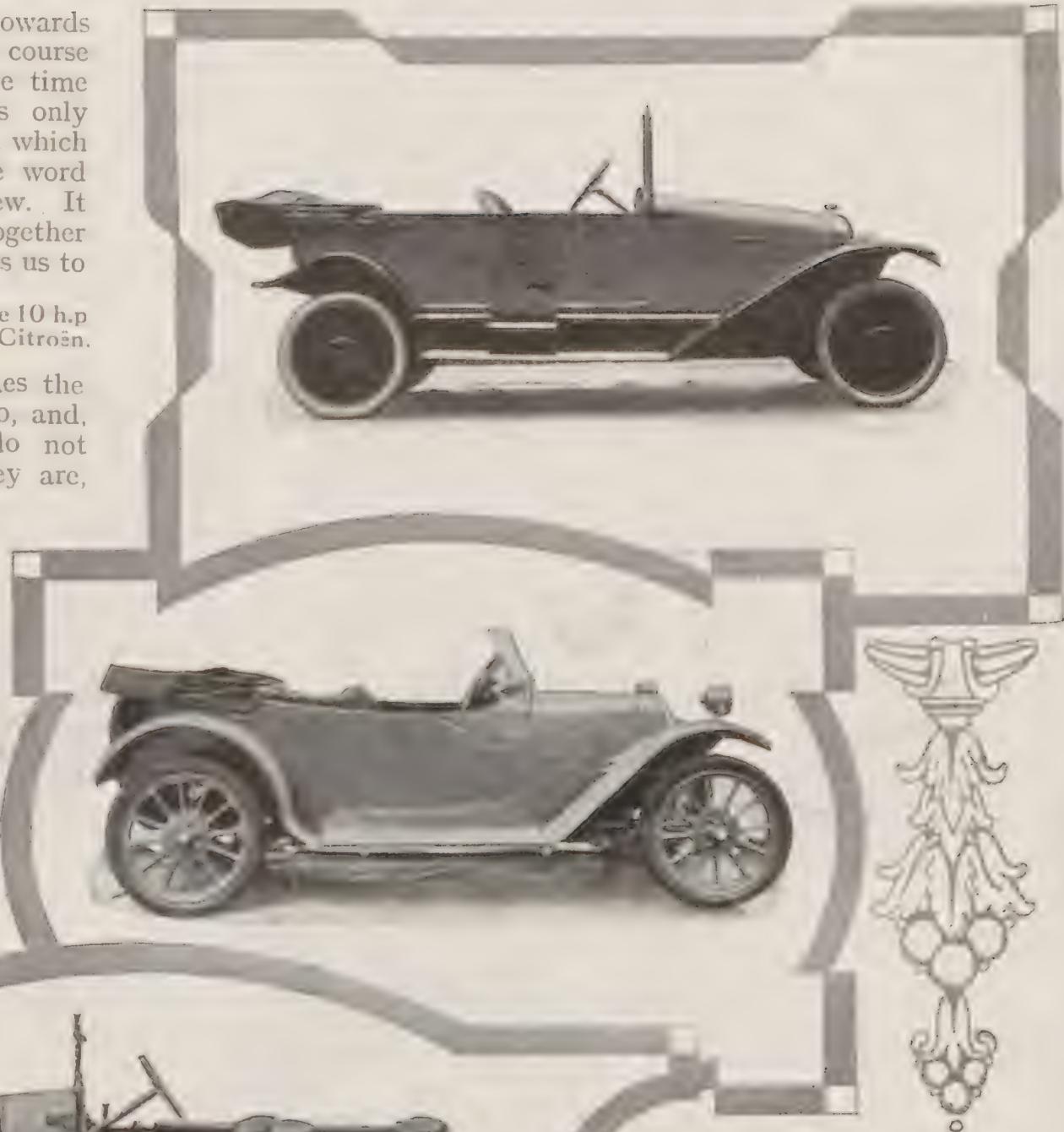
In this short review small cars with engines of over 1,500 c.c. have been omitted purposely so far, because strictly they are not light cars within the limit that has been laid down. It should be remembered that the light car was originally fostered on account of its moderate primary cost and low fuel consumption. If the size of the engine is

allowed to increase from 1,500 c.c. towards 2,000 c.c. the original ideals may in course of time be forgotten. At the same time there are many cars having engines only slightly in excess of the 1,500 c.c. limit which are light cars in every sense of the word except from the technical point of view. It would be absurd to ignore them altogether in such a review as this, and it behoves us to give the leading examples at least passing attention.

The famous Morris - Oxford and Morris-Cowley models have engines the cubic capacity of which is over 1,500, and, therefore, strictly speaking, they do not come into the light car class. They are, however, very slightly over (1,526 c.c.) Both are extremely attractive little cars, equipped with Lucas engine-starters and Zenith carburetters. They belong to the four-cylinder class, with three speeds, and reverse and orthodox car transmission.

Many examples of cars just a little too large for inclusion in the official "light car" category will be found in the 11.9 class, with bores of 69 mm., but strokes having a varying

The 10 h.p.
Citroën.



The 10 h.p.
5-cyl.
Enfield-
Allday.



degree of excess over the maximum of 100 m.m. The Morris already

referred to is a particularly hard case in this respect, since a difference of only 2 mm. suffices for its exclusion. In most cases the excess is greater, the 11.9 h.p. Calcott, for instance, having a stroke of 110 mm., and a total capacity of 1,645 c.c. The 11 h.p. Hammond—

69 mm. by 150 mm., or 2,243 c.c.

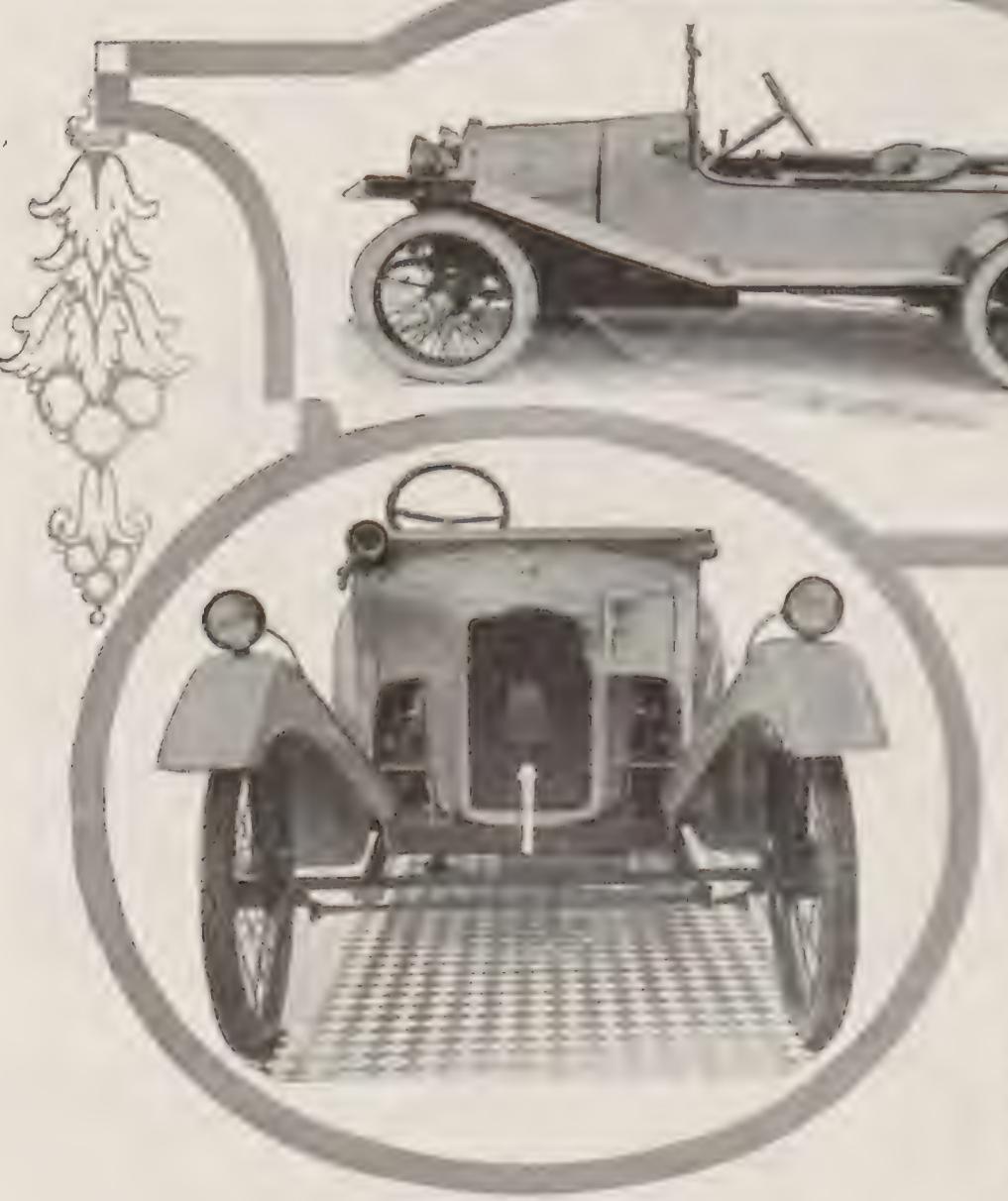
capacity—and the 11.9 h.p. Zephyr and 12 h.p. Swift—both 69 mm. by 130 mm., or 1,944 c.c.—are at the other end of the scale from the 11.9 h.p. Meteorite, which, with

a bore and stroke of 66 mm. by 110 mm., is only 5 c.c. over the 1,500 c.c. limit. The

most usual dimension of the "eleven-point-nines," however, appears to be 69 mm. by 120 mm., giving a capacity of 1,795 c.c. Under this heading come the 11.9 h.p. Bean, Dawson and H.E. cars, and the 12 h.p. Mathis, Stafford and Vulcan.

The 10-12 h.p. Briton, while essentially a light car from a common-sense point of view, has a bore and stroke of 68 mm. by 120 mm., giving a capacity of 1,743 c.c., while the 12 h.p. Chiribiri—a new Italian car—the French Sigma, the 10 h.p. Humber and the 11 h.p. Hillman are all alike in having 65 mm. by 120 mm. engines which are 93 c.c. over the limit.

Front view
of the 8 h.p.
2-cyl. Rover.



NEW POINTS IN ENGINE DESIGN.

IT would be difficult to imagine a motor show more interesting than Olympia to students of engine design, for during the war period big changes have taken place, new principles have been adopted, and these, naturally enough, have been applied in a hundred-and-one different ways. In the ordinary way one could have spent an informative day simply examining engine details, upon which a large book might easily be written, but in view of the difficulty of getting sufficiently close to the exhibits the doors of the show were hardly open long enough in the aggregate to allow such a specialised tour to be made. Hence this note has no pretensions to completeness. It certainly leaves out more than it deals with, and it is very distinctly haphazard, but the difficulties of obtaining information must be blamed. It is particularly awkward to start a sketch on one stand, get through most of it by peering over people's shoulders, and finish it on another stand to which one has been hustled by mere weight of numbers.

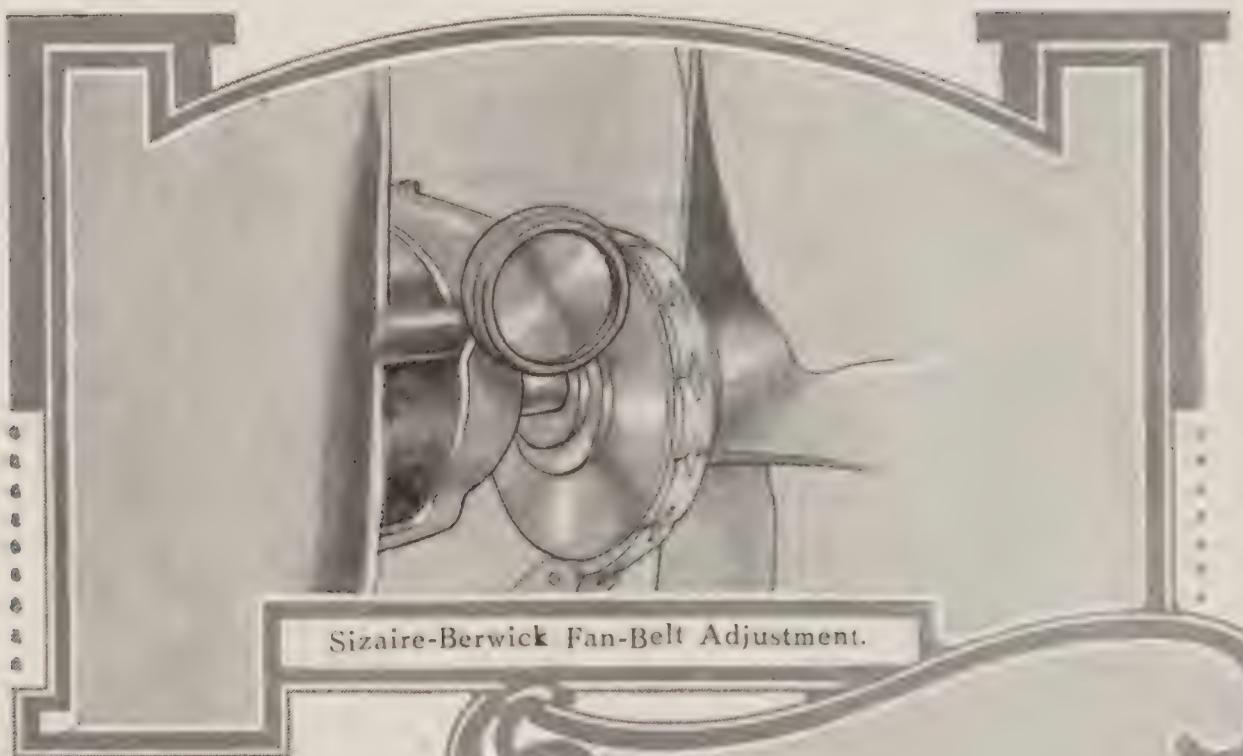
The ways in which various makers have materialised the overhead valve scheme are alone worth an article in themselves (and will duly receive one). In the meantime two systems which are distinctly unusual have been noted. Most overhead valve engines follow the practice of enclosing the camshaft, the rockers, and the valves under a single cover, though there are others which adopt the Buick practice of using external



tappet rods and rockers and driving them from a camshaft in the ordinary position. In the Albert engine the vertical tappet rods are inside the cylinder casting and the whole mechanism is enclosed. The Armstrong-Siddeley scheme, as sketched, appears to be very sound, as it is unquestionably cheaper than using an overhead camshaft (such as is found on Bentley, Lanchester, Napier, Dawson, Wolseley (15 h.p.), A.C. and several others), and provides for complete enclosure of all moving parts, the vertical rods being contained within aluminium tubes, as shown. The overhead valve gear in the 12 h.p.

Dorman engine, which forms the power plant of several chassis, is also interesting, as in this system two camshafts are used, one on either side of the crank-chamber.

In the Straker-Squire several unusual points present themselves. This is a sample of pure aircraft engine practice, with separate cylinders, each with its own welded steel water jacket. The camshaft, as in Mercédès aero-motor design, runs along the top of the cylinders and the rocker mechanism is carried in boxes from each side of which the valve end of the rocker projects, as shown in the sketch. This represents



Sizaire-Berwick Fan-Belt Adjustment.

probably the lightest manner in which the overhead principle can be carried out. In the interests of weight economy we noticed particularly the welded sheet steel exhaust manifold on the Straker and also on the Bentley.

This last had a somewhat peculiar feature in the very large breathers which branched from four points of the crank-chamber and ended in a couple of big vertical pipes crowned by conical cowls. Into these cowls are led drain pipes from the overhead distribution casing. These drain pipes are of large diameter and ensure that the valve mechanism, whilst always well supplied with oil, is never lubricated to excess. Good breathers mean a clean engine.

This point appears to have been well had in mind in the design of the 12 h.p. Peugeot. Instead of being fixed in the crank-chamber, in this case the single breather, which is also the oil filler, forms a sort of chimney at the rear end of the block cylinder casting and ends up in a conveniently shaped box formed in one with the water outlet casting. The position of the breather and its height above the crank-chamber ensure that no liquid oil can be flung through it and certainly make for a neat and simple exterior.

One could hardly fail to notice how



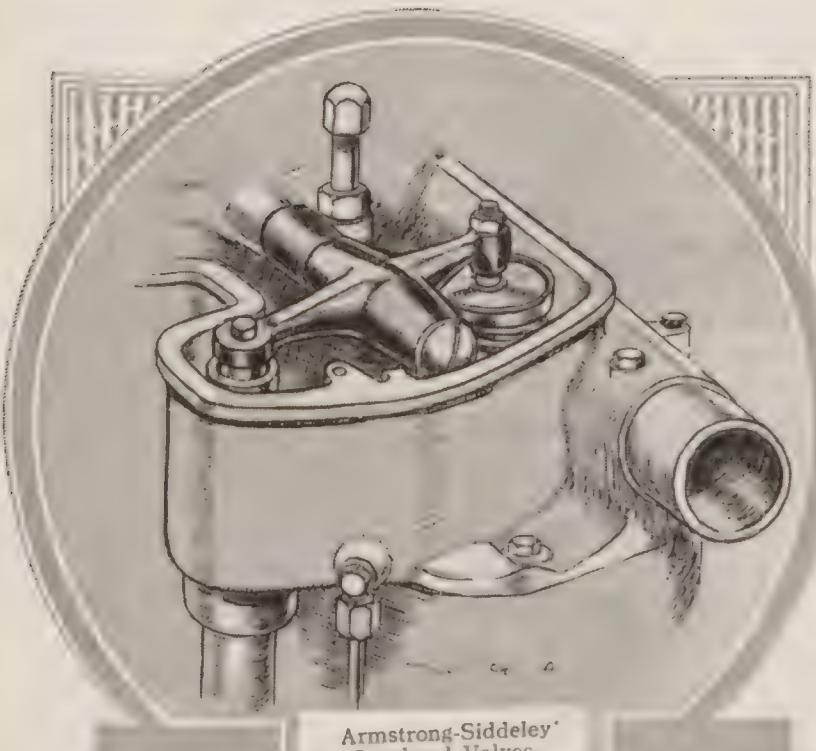
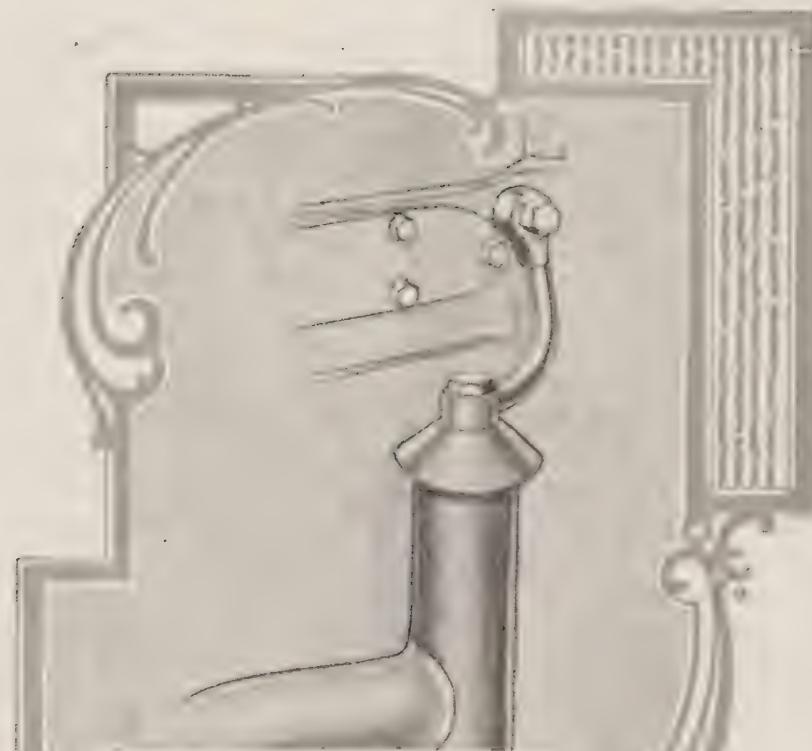
De Dietrich Fan-Clutch.



The Sizaire-Berwick Ignition Connections.

the practice of combining the exhaust and inlet manifolds into one component, so that the hot gases encourage vaporisation, is growing in popularity. It, too, leads to simplification. A good case is found in the Angus-Sanderson, in which the double manifold is fully water-cooled and connected by a gasket with the cylinder casting. The interior of this arrangement cannot, of course, be seen from the outside, hence this was not the most obvious case of exhaust and inlet combination. In the new air-cooled horizontally opposed 8 h.p. Rover one gets a similar system without water jacketing, though, as a matter of fact, there is a very big difference between the two methods. In the Angus-Sanderson the inlet gas impinges on a "hot spot" immediately on leaving the carburetter, whereas in the Rover the whole inlet pipe is a "hot-spot" of which the hottest point is adjacent to the inlet valve, and the coolest at the carburetter. This double pipe is a welded steel job and commendably light.

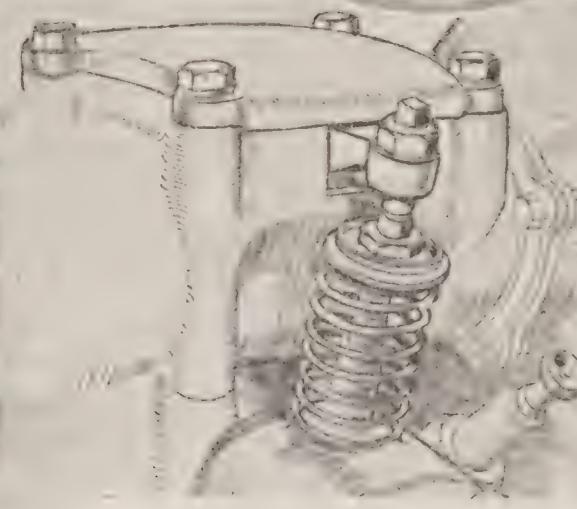
A completely automatic system of lubrication is found on all cars to-day, and in some cases, as for instance in the 20 h.p. Guy, is extended beyond the engine so as to include all chassis details as well. In a few cases it did not appear that the need of a really efficient fine-mesh filter had been sufficiently realised, and in others where the point had received attention such filter was highly inaccessible and therefore not likely to encourage the frequent cleaning out which it demands. In the Vinot car

Armstrong-Siddeley
Overhead Valves.

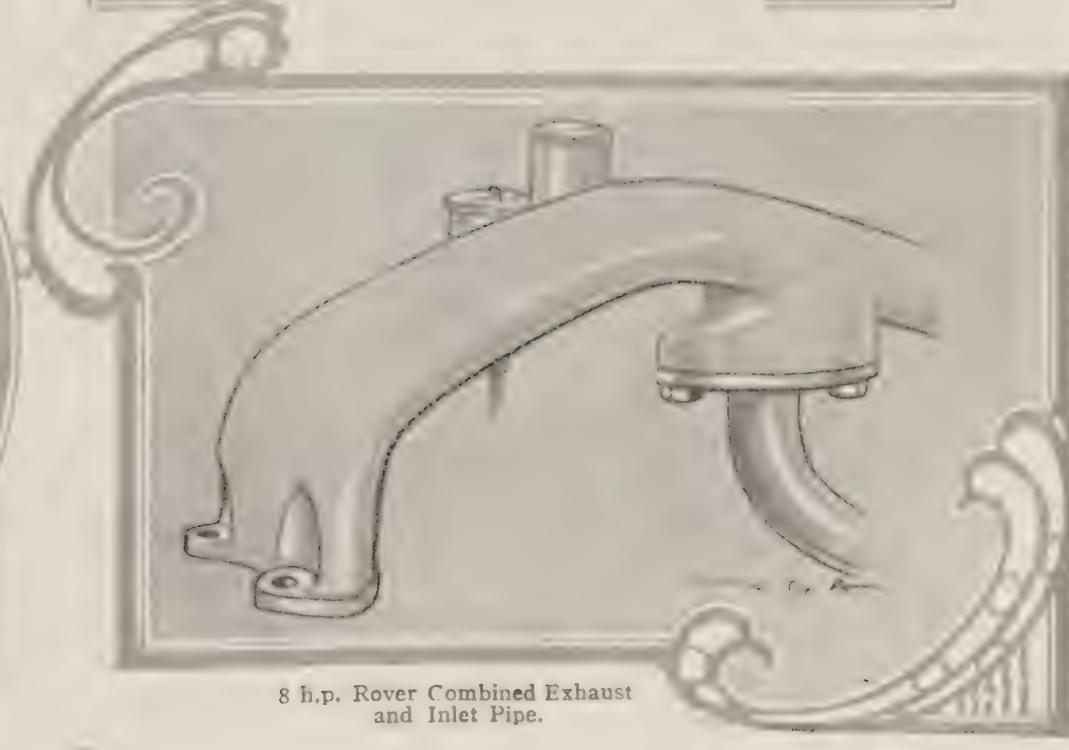
Bentley Breather and Drain Pipe.



15 h.p. Wolseley Starter Switch.



Straker-Squire Overhead Valves.

Peugeot Oil-Filler and
Breather.8 h.p. Rover Combined Exhaust
and Inlet Pipe.

one noticed that the filter had been bodily removed from the engine and clapped on the dashboard in a very get-at-able situation. To remove the filter in this case, as shown in the sketch, is practically a "clean-hands" job and consequently little likely to be shirked. Also the filter is of really large dimensions. Needless to say a primary strainer covers the filter cap on the crank-chamber. The Vinot device is interesting as it is in distinct opposition to a modern tendency to bury everything inside the engine.

Very few cars are now found with neither pump nor fan (though Angus-Sanderson is a notable exception), and so far as the more powerful vehicles are concerned there is no tendency to forsake positive for thermo-syphon circulation. In the majority of small cars, however, the pump does not exist, but the fan is a standard feature. Where it is absent sufficient care has, in some instances, not been used to ensure that the air after passing through the radiator can readily get away. An excellent example of "assisted" water circulation is seen in the admirable new 15.9 h.p. Humber. Here the fan spindle is extended rearwards to carry an "impeller" contained within the inlet water pipe, part of which last is cast into the cover of the timing gear case. This installation is very neat indeed and has the advantage that if the fan belt should break the circulation can freely continue on the thermo principle. It will be observed that by placing the carburetter water jacket pipe adjacent to the impeller a brisk circulation is encouraged therein.

It is pleasant to note that far more care is now taken in the mounting of radiators to insulate them from any possibility of strain through frame distortion. Sometimes the hinge rod of the bonnet is used to secure the peak of the radiator, but a better method is found on the new 12 h.p. Swift. Here there is a spring stay between the radiator and the water manifold, so that no tension is applied to the rubber connection, and at the same time no frame whip could be communicated to the radiator.

On the whole cooling systems have been much improved, the idea of making an internal and simple form of radiator and surrounding it by a separate framing is rapidly gaining in vogue. Armstrong-Siddeley and Arrol-Johnston are cases in point. One would imagine, too, that fans are more efficient; they are certainly better made except in a few American cars in which a doubled-over strip of soft steel is apparently considered good enough. In the Sizaire-Berwick car excellent provision is made for fan belt adjustment, no tools being required. The fan spindle is fitted with an eccentric bushing which is revolved by turning a knurled thumb wheel which operates an irreversible worm gear. A better instance of carefully considered attention to detail could hardly be found.

In the Lorraine-Diétrich six-cylinder car the six-bladed fan is connected by a simple friction clutch to the belt pulley, so that the fan can be put out of action from the driver's seat. An auto-thermometer thermometer is fitted into the radiator cap, so that no difficulty need be met with

in keeping the engine at a predetermined optimum temperature.

We were especially impressed with the neatness of the electrical installation in the new 15 h.p. Wolseley, in which, by the way, the magneto has been displaced by the coil. In order to simplify the starting motor connections the starter switch is mounted on the aluminium flywheel housing and projects through the floor board ramp. Keeping the heavy dirty cables away from the bodywork altogether is a good idea. Admirable also as an example of sound design is the Lanchester starter installation, in which the motor is mounted vertically on the side of the crank-chamber and drives the crank-shaft through a train of enclosed skew gear-shafts, the ordinary flywheel rack not being used.

The Sizaire-Berwick ignition wire installation is worthy of special note. On leaving the magneto the wires are all entirely enclosed inside an aluminium manifold clamped to the cylinders. The boss-ends of this carry two hinged horns which drop down on to the plugs. Any plug can be instantly cut out of action.

Inconsiderate Driving.

SIGNED by Sir Arthur Stanley, the chairman, and Sir J. W. Orde, the secretary, the following statement has been issued by the Royal Automobile Club:—

"The Committee of the R.A.C., having received a number of complaints of inconsiderate driving in various parts of the country, particularly on parts of the Great North Road, desires to appeal earnestly to all drivers of motor cars, motor cycles, lorries, etc., to drive always at a moderate pace and with due consideration for other road users. The offenders are believed to be comparatively few in number, but their method of driving is calculated to create much ill-feeling and antagonism.

"There appear to be a number of people without any knowledge of the road or the courtesies thereof who have acquired motor cars and motor cycles since the Armistice and the offenders are amongst these. The car owner of former years and experience rarely, if ever, offends in this way. In 1914 hardly any cases of inconsiderate driving were brought to the notice of the Club, and it was hoped and believed then that this regrettable practice was at an end. Unfortunately, there has been a revival during the last year. Therefore, to those who have offended in this way the Club issues this appeal to observe the rights of others. If it is of no effect the Club will itself take action by undertaking prosecutions, as it has done in the past."



FRONT-WHEEL BRAKES.

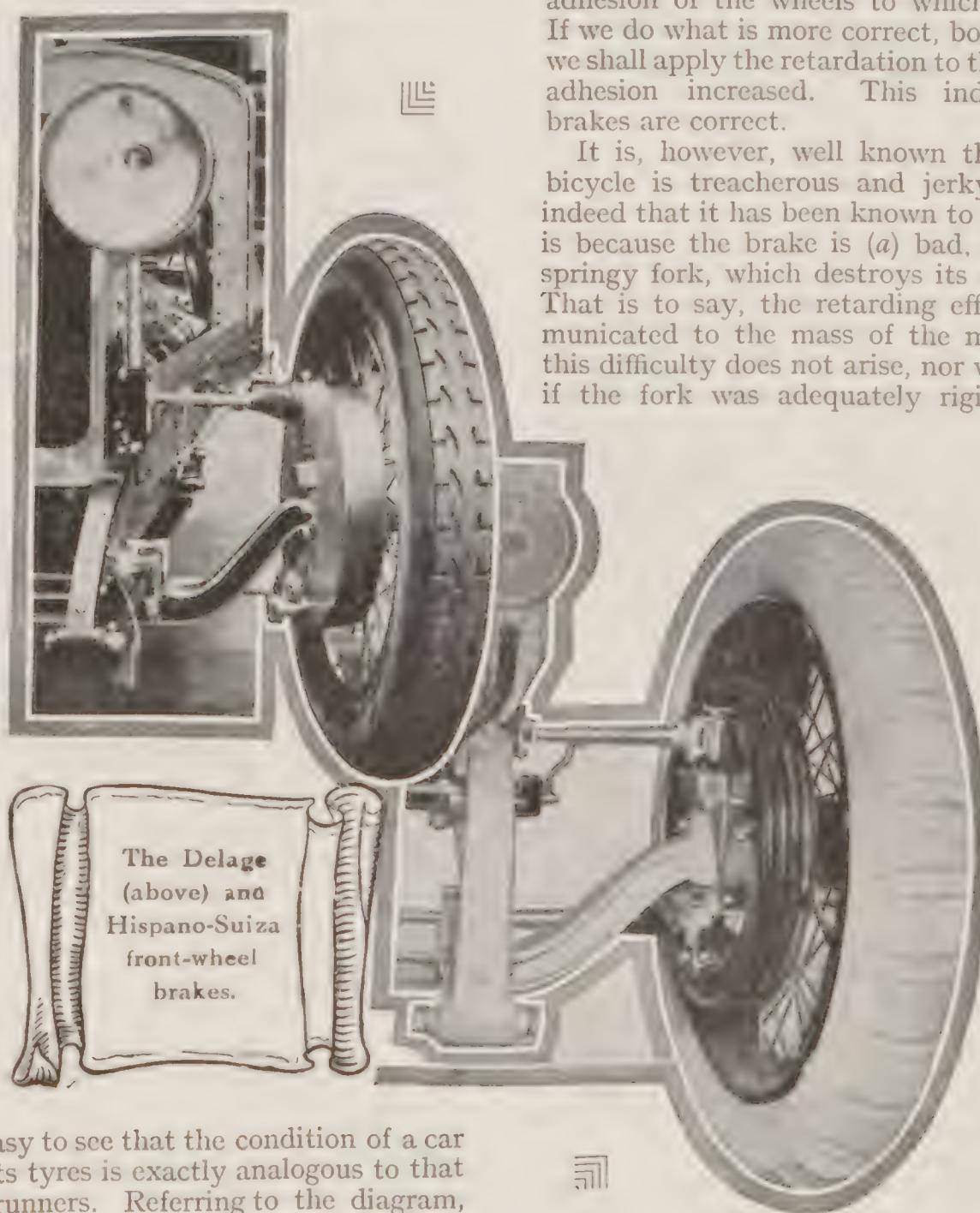
Their Good Points Analysed.—By CAPTAIN W. GORDON ASTON.

I DOUBT if there is anything in connection with the motor-car the action of which is so little understood as front-wheel brakes. This system, which is now seen on several notable Continental cars, is essentially British in origin, having been used by Allan-Liversidge and Argyll quite a number of years ago. Having regard to the circumstances with which I shall presently deal, and bearing in mind the twistiness of British roads, we ought, I think, in this country to take shame to ourselves for having done so little to exploit a mechanism which materially adds to the scope or performance of the automobile. In the following short note I propose to show (I) why front-wheel brakes are good; (II) why they act as a preventive of skidding; (III) why they are better than rear-wheel brakes; and (IV) why they are necessary.

(I) WHY FRONT-WHEEL BRAKES ARE GOOD.

By whatever means an effect of retardation is applied to a car (short of heaving an anchor overboard in the hope that it will grapple a telegraph pole) resistance to forward motion is ultimately applied at the point at which the tyre makes contact with the road. In the limiting case, at which the wheels are locked solid, it is easy to see that the condition of a car slithering forward on its tyres is exactly analogous to that of a sledge moving on runners. Referring to the diagram, Fig. I, resistance to motion, therefore, is applied through the point A.

Now the momentum of the car is stored or concentrated in its centre of gravity B. This point, according to the design of the car, is at a certain height above the road surface, but it can never be coincident with it or below it. When a car is braked, you have then the resistance along the line A and the momentum along the line B. These two forces are not opposite to one another, but form a "couple," the effect of which is to promote a rotary movement of the whole car about its centre of gravity B. That is to say, when the brakes are applied, the effect is that the load on



the front axle is increased and that on the rear axle is decreased. A weekly contemporary recently suggested that the centre of gravity itself moved. This, however, does *not* take place.

It will easily be understood that the grip or adhesion of the road wheel depends upon the weight which it supports and which keeps it in contact with the road. Ordinarily we brake the back wheel, but it is clear from the diagram that in this case the effect of braking is to reduce the adhesion of the wheels to which the brakes are applied. If we do what is more correct, both in theory and practice, we shall apply the retardation to the wheels which have their adhesion increased. This indicates that front-wheel brakes are correct.

It is, however, well known that the front brake of a bicycle is treacherous and jerky in action, so much so indeed that it has been known to unsaddle the rider. This is because the brake is (a) bad, or (b) applied through a springy fork, which destroys its steadiness in application. That is to say, the retarding effect is not properly communicated to the mass of the machine. In a motor-car this difficulty does not arise, nor would it do so in a bicycle if the fork was adequately rigid for accepting braking stresses.

Put into simple language, when front-wheel brakes are used on a car the consequent deceleration tends to increase the adhesion of the front wheels and makes the brakes effective. *Per contra* it tends to lessen the adhesion of the rear wheels, and so makes rear-wheel brakes less effective.

(II) WHY FRONT-WHEEL BRAKES PREVENT SKIDDING.

It ought to be well known that a rolling wheel presents more resistance to sliding sideways than a wheel that is not rolling. A bicycle that is being moved

along is not so easily bodily dragged sideways as one of which the wheels are stationary. The same applies to a garden roller. A roller skate, in making an outside edge, takes advantage of the same phenomenon. Rolling motion implies adhesion.

This rolling motion can be destroyed either by applying acceleration (by the power of the engine) or by braking so as to promote retardation. In either case a similar effect is obtained. It is easier to skid, or rather side-slip, on low gear than on high, and it is easier to do so with the brakes on than with the brakes off. A wheel that can freely roll

is less liable to side-slip than one which has to transmit power—than one which is braked.

Glance at Fig. 2. It represents a four-wheeled "sledge" or velocipede taking a corner. Centrifugal force tends to throw it radially and bodily outwards. This tendency is resisted by the wheels on account of their adhesion as rolling wheels. If the centre of gravity is in the middle of the vehicle there is the same outward thrust on all the wheels. If the adhesion of the latter is insufficient to resist centrifugal force the whole vehicle is caused to side-slip, but as each wheel side-slips to the same extent the *direction* of the vehicle is not sensibly altered.

Now in the case of a car the back wheels are receiving the power from the engine and are, therefore, being driven.

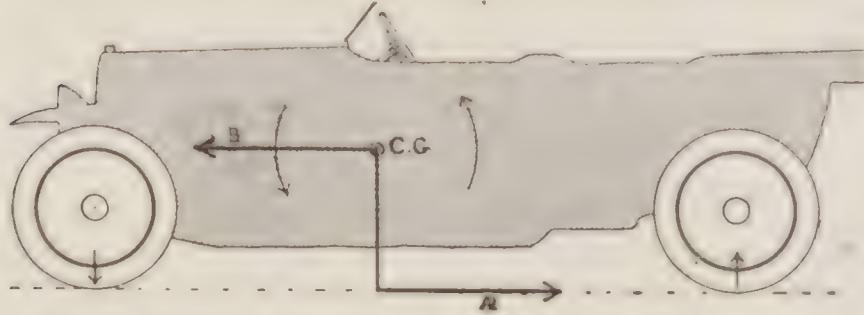


Fig. 1.—Diagram illustrating the lines of resistance to motion under brake application.

Supposing the clutch is out, they are having to overcome the friction of the back axle, and are, in this case, driving. All the more are they driving if the brakes are on. In almost any case their adhesion is less than that of the front wheels. Hence in taking a corner, a car will tend to side-slip back-wheels-outwards, since the rear wheels have less adhesion than the front—the latter simply rolling.

The more the power that is transmitted through the back wheels—*e.g.*, accelerating the engine on a low gear—or the more the retardation that is applied—*e.g.*, putting the



Fig. 2.—Diagram showing a car skidding, back wheels outwards, when taking a corner.

brakes on—the greater will, therefore, be the tendency to side-slip. Every good driver knows that the best way to cure this evil tendency is to declutch. This gives the back wheels a chance to regain their adhesion by approximating to the rolling condition.

Absolutely to prevent skidding the braking effect should be equally applied to all four wheels, and the driving effect likewise. But skidding must tend to occur if only the back wheels are driven and braked.

If only the front wheels are braked the tendency to skidding is decreased. By rolling the back wheels will retain adhesion and the car will be analogous to the long "pencil" of the sign writer. His hand may tremble, but

the tail of the brush will draw a tolerably straight line. For the same reason, a ship, or an aeroplane, answers best to a rudder which is placed behind. Rolling wheels at the back of a motor-car act as a rudder.

Thus front-wheel brakes, applied alone, allow the car to maintain a sense of direction, and permit it to be kept under control. Steering, in these circumstances, will correct a side-slip. In ordinary conditions we know that steering has no effect whatever.

In the ideal car all four wheels are braked equally. In that case the sense of direction is maintained, no matter how slippery the road may be. A car with all four wheels locked can be steered with nearly as much accuracy as one in which all four wheels are freely rolling, and far more accurately than one in which the back wheels only are locked.

(III) WHY THEY ARE BETTER THAN REAR-WHEEL BRAKES.

This now becomes a corollary of what has been said. The car with front-wheel brakes can be pulled up, can skid—and can still be steered. The car with back-wheel brakes only cannot.

But a secondary point is that relating to comfort. This quality largely depends upon the unsprung weight of the axle. Brakes are, when directly applied to the wheels, unsprung weight. A slight addition of unsprung weight to the already light front axles does less harm than a similar addition to the already heavy rear axle. Hence the disposition of brakes on all four wheels is sound from the suspension point of view. Practically there are difficulties in the way, but that these can be overcome is well exemplified in the Hispano-Suiza, the Picard-Pictet, and the Delage cars.

(IV) WHY FRONT-WHEEL BRAKES ARE NECESSARY.

The essence of transport is speed. What is wanted is not so much high ultimate speed as high average speed. Since roads are not straight in this country, high average speed can only safely be attained by rapid acceleration and rapid retardation. The former point is well looked after in the modern chassis. The latter is best looked after by front-wheel brakes. They allow the whole adhesion of the car to be taken advantage of, whereas rear-wheel brakes allow little more than half of such adhesion to be usefully employed. Brakes on all four wheels will allow a car to be pulled up in roughly *half the time* required for a single braking system. Hence average speed from point to point can be enhanced. Front-wheel brakes tend towards a distribution of stress over the whole chassis, which is desirable in the interest of lightness compatible with strength. It is a truism that rapid braking because of the usual unequal distribution of stress does more harm to a car than anything else; it is nearly always more rapid than acceleration.

Supposing one observed the legal limit and never exceeded it, one could, with front-wheel brakes, safely average *nearer* 20 m.p.h. than with rear-wheel brakes only. By a parity of reasoning one can thereupon average higher speeds with the same (or even less) risk to oneself and to other roadfarers.

Higher average speed is necessary. Greater safety is necessary. Therefore, front-wheel brakes are necessary.

The only trouble is that front-wheel brakes are more expensive, at present, than double rear-wheel brakes, and for this reason they are only found on a few expensive cars. But expense, after all, is purely a relative consideration—of which electric starters form a good case in point. Ultimately they will have their place on every car.



By Miss CHRISTOBEL NICHOLSON.

I WOULD like to annex a fairy godmother with sporting instincts who would wave a jack handle over my head and produce the car of my choice.

But what is the car of my choice?

The new models which we viewed with such envy at Olympia were so altered and improved as to be hardly recognisable. Variety was the order of the day, and one almost expected the agents to say: "Yes, madam, what type of engine do you prefer? We cater for all tastes. Do you fancy overhead valves; or, perhaps a 'Silent Knight'; and do you wish for a magneto?" However, I managed to pull myself together, and, in spite of the chaotic toe-trampling crowds, I saw enough of the new models to evolve my ideal of a car.

From a woman's point of view (and, being my point of view, it is not highly technical) the outstanding features of the 1920 models are:

- (1) Greater simplicity in chassis construction.
- (2) Increasing tendency to central gear and hand-brake controls.
- (3) Facilities for rear-wheel brake adjustments.
- (4) Almost universal fitting of electric engine-starters.
- (5) Autovac petrol feed largely replacing petrol pressure pumps.
- (6) General accessibility and cleanliness of the engine.

Simple chassis construction minimises work. Fewer rods, wires, and joints mean less greasing and oiling and easier adjustment of those parts which may need it.

Of course, the policy of fixing the gear and hand-brake controls in the centre of the car has

mechanical advantages and allows the driver to enter from the right; but I do not like the idea. Perhaps I am abnormally right-handed; perhaps I use my hand brake to excess, but I know that my left arm could never obtain the same power over the brake as my right arm could.

Rear-wheel brakes—or, rather, their adjustment—used to mean several hours' purgatory on one's back in the mud, and the dirt that came from below was nothing in comparison with that which rained from above at every wrench of the spanner.

One of the 1920 models has the most perfectly accessible brake adjustment that I have ever seen. The two brake-rods lie just inside the frame, running parallel with it until the body of the car tapers off towards the radiator. At this point each rod protrudes very slightly through the body just above the running board, and carries a butterfly nut. This nut simply asks to be played with, and converts brake adjustment from pain into pleasure.

Starting handles are rapidly joining the realms of what has been, for which Allah be praised! Feminine muscles—and such phenomena do exist—will no longer ache from having cranked an unsympathetic engine to a start on a cold morning. Electric engine-starters have revolutionised the motoring world of woman-kind in much the same way as her first baby's first tooth affects her domestic happiness.

Another inglorious absentee is the petrol pressure-pump. It ranked as one of man's worst inventions by reason of its irritating little valve, always hidden in some inconceivably ridiculous position, which made a habit of releasing pressure at the most inconvenient

moment. A great many manufacturers have replaced the pressure pump by the Autovac petrol feed, which has already proved its worth. Only once have I ever known it to fail, and that was through no fault of its own.

It had just been fitted to a car, and somebody had bungled. Enough petrol was left in the Autovac to enable the car to run about a quarter of a mile, but no more was being sucked from the main tank. Consequently the engine petered out in the very middle of the junction of the Knightsbridge and Brompton Roads. The driver, being a moderately stolid lump of

femininity, switched on the light in the coupé and produced the book of the



"I AM NOT READING FOR PLEASURE. I'M ONLY TRYING TO DISCOVER HOW I CAN EVER MOVE AGAIN!"

words, in which she searched for the necessary information.

Motor-buses skidded round her, taxi-drivers cursed, but she remained imperturbable. Finally a policeman stepped up :

"I say, miss, you must move your car. You can't sit here and read, you know."

"I'm perfectly aware of that," retorted the lady. "I am not reading for pleasure. I'm only trying to discover how I can ever move again!"

In spite of this incident, which, as I have already remarked, was not the fault of the machinery, but of a wartime mechanic, I welcome the Autovac with open arms.

Engine accessibility and cleanliness may convey little to those who have never before had

the entire management of a car. They may argue that, so long as the engine is there complete, the position does not matter. I can only give an Asquithian reply.

Spark-plugs that hide their light under a bushel of oddments; carburetters in a lowly position, surrounded by split-pins and sharp-angled pieces of metal; magnetos jammed against the dashboard or radiator; valve inspection plates which present a goodly sample of dirty engine oil every time the bonnet is opened—these are things which should not exist.

The cylinders should stand well away from both the dashboard and fan, while the fan, in its turn, should not hug the radiator, for the obvious reason that a fan is too easily bent. If by any chance it bends back towards the radiator there

may be horrible trouble. When the engine is started up the noise may call forth wartime reminiscences, while the cause of the noise may call forth water from broken radiator tubes—a more serious matter.

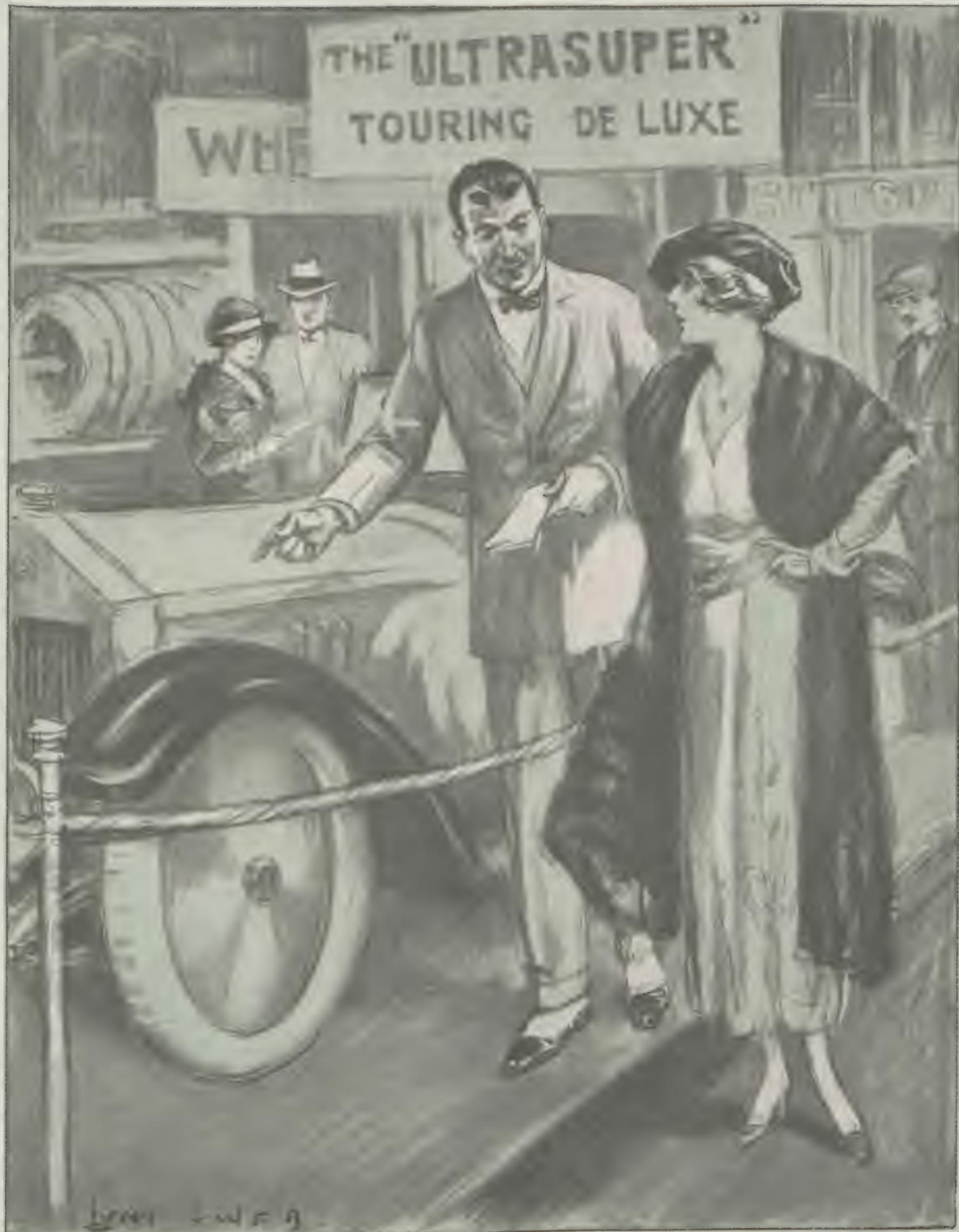
Apart from the question of accessibility, however, a clean engine is not all eyewash. Dirt means grit, and grit is persistent in its attentions,

and will ultimately find its way into the engine's internal arrangements, with horrible results.

Cleanliness is very necessary. Manufacturers realise its importance, and have simplified the car-owner's task in the majority of cases by consigning to a better place the little useless platforms and acute angles which once abounded.

The luggage carrier, alas, is almost extinct. Some two-seater models have tried to overcome the difficulty by subduing the dickey seat, but any extra room so obtained is usually pretty well stocked with tools, spare wheel and cans. Surely here is a chance for inventive genius—to devise some scheme of luggage carrying which will not offend the eyes of the coachbuilder or his client, and yet will make a tour a probability instead of an impossibility.

A MISS IN BAULK.



Salesman: "May I show you our new touring model, madam?"

Miss Fanny Frontrow: "Touring car! Why, you dear old thing, don't you know I *never* act out of London?"

THE CHARMS OF CHESHIRE.

FOR the motor-owner the county of Cheshire is replete with interest. The roads are good and the country is undulating, with excellent wooded views from every hill. There are quaint old-world villages, with cottages of the black-and-white order and thatched roofs. There are meres, or small lakes, innumerable, with seven rivers meandering through the landscape, country roads with ancient fords and bridges, old hostelleries of the fourteenth to seventeenth centuries, with new, up-to-date garages alongside or adjacent, besides ancient churches and castle ruins innumerable. The motorist who would not be charmed with Cheshire would indeed be hard to please

turesque places. Sandbach is only about 30 miles from Manchester, but on our way thither, and in the neighbourhood, we may find much to interest us and provide us with a run that will linger long in our memories.

Quietly running on the sets and tramlines through Stretford and Sale, we soon reach Altrincham, where we pass through the ancient market place, with a charter dating from King John's time. Bowdon adjoins it on a gentle rise, with a thirteenth century church, though this lies wide of our course, and we are content to note the almost palatial residences of Manchester lords of commerce. We skirt by the edge of Dunham Park, the old-time demesne of the Barons of Dunham Massey, followers of the Conqueror, the village lying two miles to our right through the park. By the side of the park, with its thousands of old oak trees and deer, we descend Dunham Hill, beloved of Manchester motorists, cyclists and pedestrians. Its old name was Shepherd's Brow, and the shepherds' cottages may be seen on the left of the illustration.



DUNHAM HILL, WITH SHEPHERDS' COTTAGES ON THE LEFT.

But Cheshire is also rich in historical and architectural interest. For domestic architecture of the Middle Ages in ancient family halls, it is probably unsurpassed. Here is to be seen the old black-and-white or "magpie" architecture in perfection, as well as in profusion. Much of the blue blood of England has sprung from the lineage of the old Cheshire families, and many of their old halls—the oldest stately homes of England—still stand in their rugged, picturesque beauty.

Cheshire requires knowing. Most of the interesting places and historical buildings and ruins lie off the beaten track, or, at least, are far from the main trunk roads running north and south, or east to west, through the county. Of such are the ruins of Halton Castle (1090 A.D.), Vale Royal Abbey, Prestbury, Great Budworth, Sandbach, Handforth Old Hall, Tabley Hall, Holford Hall, Moreton Hall, Arley Hall, Swinyard Hall, High Leigh Hall, Baguley Hall, Astbury and its church, Norton Priory, Rock Savage (1565), Brimall Hall, Peel Hall, and many others, mostly moated granges.

A study of county history is almost essential to properly appreciate and discover the most interesting places, as the motorist could pass many of these without an inkling of their proximity, though within almost hailing distance.

Let us take a typical run from Manchester or its residential suburbs in one direction only, with the ancient village of Sandbach as the furthest objective point, to see what we may discover in the way of interesting and pic-



MERE CORNER AND THE LODGE GATE OF MERE HALL.

A few yards further we cross the valley of the Bollin, reputedly the scene of Dick Turpin's arrest for highway robbery. A mile to the right is Hoo Green with its inn and ancient bowling green, where tradition says that Turpin often played bowls after his highwayman exploits.

We get a long rise further on, up Bucklow Hill, with a beautiful view on our left of the famous Rostherne Mere (supposed to be bottomless) and its ancient church. Soon we reach a motorists' Mecca in the Swan Hotel at Bucklow. A favourite hostelry this, with a reputation for catering which many London hotels might envy.

A mile further along is Mere Corner, noted because it is a typical carrefour, with roads leading east, west, north and south. We have arrived as from the east, say from York, Leeds and Manchester. To proceed will take us anywhere west, to Northwich, Chester, or North Wales. Southwards will take us to London, Oxford, Coventry, or Land's End, if need be, and north leads to Scotland, by way of Warrington, Wigan, Preston, Lancaster, etc. All are grand trunk roads. On the corner are the picturesque lodge and entrance gate to Mere Hall.

Our road to Knutsford leads south here, but we will go

THE DANGER OF DELAY

What "waiting until next year" means to potential A.A. members

The following extract is taken from a letter received recently by the Automobile Association:

"I thank you for the booklet, which I have read with interest. The service which is offered by your Association is excellent, but, as I shall not be doing much motoring after the end of this month until next Spring, I think I will wait till then before joining."

When it is remembered that the work of the Association is carried on throughout the year, that subscriptions run for twelve months from date of joining, and that a single motor trip without the A.A. badge is an avoidable motoring risk, the unwisdom of such a decision will be realised by others, as it was by the writer of the above letter, when his attention was drawn to it.

Membership of the A.A. alleviates such motoring risks as:—

Unnecessary delay due to a breakdown, lack of motor fuel, spares, etc. The khaki-clad A.A. Patrol will render invaluable help in any of these emergencies.

Charges under the Motor Car Act. Under the Free Legal Defence Scheme, A.A. Solicitors will represent you in any police court in the United Kingdom, saving you pounds in travelling expenses and, probably, a day's business loss.

Foreign Customs Dues. If a member of the A.A., you can take your car into a 70 per cent. tariff country on a banker's indemnity alone and without depositing hundreds of pounds in Customs dues.

"Taking the wrong road." Detailed itineraries of routes throughout the United Kingdom, together with accurate guide cards of all the larger towns are supplied to members.

Buying a "dud" car. Qualified engineers advise on the choice of cars and motor-cycles, and report upon motor vehicles, new and second-hand, offered to members.

Unsatisfactory Hotel Accommodation. The A.A. Handbook contains a list of all the A.A. officially appointed Hotels throughout England, Scotland, Ireland and Wales.

In addition, membership of the Automobile Association secures free use of the Roadside Telephone Boxes, Mechanical First-Aid Cycles, Special Insurance Facilities, etc., etc., and it is to the personal advantage of every motorist

who is not already a member to become one without delay.

Write to the Secretary, The Automobile Association, 33 Fanum House, Whitcomb Street, London, W.C.2, for a free copy of the booklet, "The Key to the Open Road," which contains full particulars of all A.A. benefits and the objects of the Association.

Motorists in London are invited to call at Headquarters, where a staff of experts is always in attendance to give information on any question relating to motoring.



The Supreme
SUNBEAM



Models and Prices

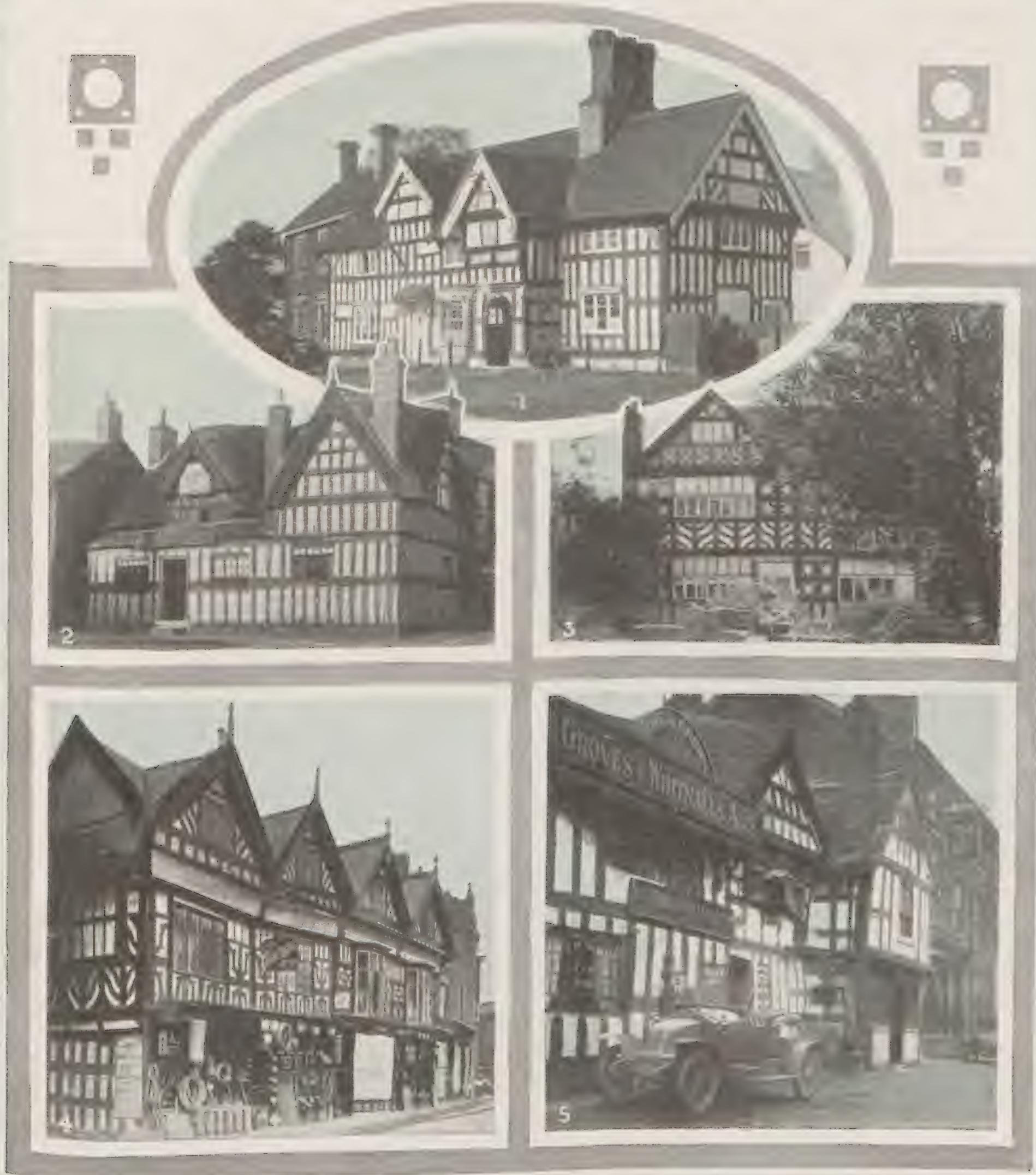
16-h.p. Chassis . . .	£850
16-h.p. Touring Car .	£1125
Semi Sporting Car .	£1125
Limousine Landaulette	£1275
24-h.p. Chassis . . .	£1125
24-h.p. with long wheel base	£1150
Touring Car	£1400
Semi-Sporting Car .	£1400
Limousine Landaulette on long wheel base	£1650

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1.—THE BEAR'S HEAD, BRERETON. 2.—THE BLACK BEAR, SANDBACH. 3.—HOLFORD HALL.
4.—OLD BUILDINGS IN NANTWICH. 5.—THE ROSE AND CROWN, KNUTSFORD.

SOME TYPICAL EXAMPLES OF THE "MAGPIE" HOUSES OF CHESHIRE.

a mile or two further on to inspect old Holford Hall, the ancient home of the Holfords of Holford, one of the most noted of the old Cheshire families. This could easily be missed, as it lies half a mile off the road, down a narrow lane on our left. Holford Hall is very ancient and moated, with an old stone bridge with seats. It is now a farmhouse with only one old part left out of three. So late as 1880 it was quadrangular, with a balcony on the left of the courtyard. A farmer's man informed me that it was "restored" in 1100 A.D. Nevertheless, it is interesting and historical. According to Ormerod's *Cheshire History* it was built about the year 1316 A.D. Many noted families spring from the Holfords of Holford, and one of the family was granted lands at Rudheath a mile or two away, for his good services at the Battle of Poitiers.

Purring our way back to Mere Corner, we turn to Knutsford, the "Cranford" of Mrs. Gaskell, who lies buried here, and famed as the place

as a young girl, with the Duchess of Kent), and last, but not least in interest, is the Rose and Crown, reputedly the oldest house in the town, dating from 1610.

Another place of interest is the house formerly occupied by the famous, or infamous, Higgins, the highwayman, of the eighteenth century. This individual led a dual existence, alternately passing as one of the gentry, mixing with the local squires and dames as a popular personality, and acting betimes as a common thief or highwayman. Some of his exploits vie with those of Dick Turpin or Claude

Duval, though he did not descend to violence. Robbing, as he did, those with whom he mingled personally, he was finally found out and punished.

Eight miles further, in a southerly direction, brings us to Holmes Chapel, or Church Hulme, as it appears on all old maps. As the name implies, there is an old church here with an old inn adjoining, but little of historical interest. Two miles further on we reach the old Bear's Head Inn at Brereton, as pretty and picturesque a piece of black-and-white architecture as any in Cheshire. The date on the door lintel is 1603, but some authorities consider parts of it to be of a much older date.

The Breretons of Brereton are a very old Cheshire family. The entrance to the park and hall (built on the site of an older one) stands just beyond the Bear's Head. The Breretons of Brereton came of Norman



1. THE HOUSE OF HIGGINS, THE HIGHWAYMAN, AT KNUTSFORD.
2. BRERETON HALL AND LAKE.
3. ASTBURY CHURCH AND GREEN.

where King Canute the Dane forded with his army an elongated mere in the hollow below the village. Its annual crowning of the May Queen and the attendant processions, morris dancing, and ceremonials are the most notable in the country. They were discontinued during the war, but revived again for 1919, and as successful as ever in the past hundred years. There is much to interest us here, for it is an old-world place, and peace and quietness reign, though only 16 miles from Manchester. Some very ancient hostleries are to be seen—the White Bear, Angel, Red Cow, Royal George (Queen Victoria once stayed here

ancestry, the family pedigree dating from 1176, and there was an ancient hall here at that early date. The present structure dates from 1586, and formerly contained ancient glass windows depicting the Earls of Chester from Earl Lupus's time onwards.

Proceeding again southwards from Brereton for a half

MORETON OLD
HALL, VIEWED
FROM ACROSS
THE MOAT.



ONE OF THE GEMS OF CHESHIRE ARCHITECTURE: MORETON OLD HALL.

mile, we reach a road leading off to the right with the legend "Sandbach, 4½ miles," which town is soon reached. Here is a rich feast for the antiquarian. Ancient manor houses, old inns and cottages, with the richest of black-and-white architecture, predominate. It is an old-world market town which seems to lie off all main roads, yet it is all ancient, and one feels to have gone back to the period of Charles I. at least. But this little town is far older. The old Saxon crosses in the market place date from the sixth century, if not earlier. They are among the finest monuments of antiquity in the country, though they have had their vicissitudes, having been thrown down and parts hidden for centuries. There is an old hall here and the Black Bear Inn is very ancient, as are also the old buildings now used as shops.

Leaving here regretfully, we have a nice run for five miles or so to Church Lawton, on the Staffordshire border, where we turn left through Red Bull village (alluded to in several novels of Arnold Bennett) towards Congleton. A few miles further, and on our right, apparently in a field, we reach Moreton Old Hall. We must on no account miss this, and we turn through a common wooden gate and along a cartway drive to inspect. Old Moreton Hall is the gem of Cheshire, being the finest specimen of old domestic architecture in this or any other country (not even excepting Bramall in the same county). It is moated, and the entrance is by a fine stone bridge. The place is vast in extent, the oldest part dating from about 1320 A.D. Across the courtyard is a more modern part, comparatively, dating from 1559, and an inscription over a fine bow window in this portion informs us that "This window, by the grace of God, was erected by Richard Dale, Carpeder, in the yeare of our Lord 1559."

The Hall is now but a show place and a farmhouse. Motorists can have tea here, with fresh eggs, butter and ham produced on the premises, and it is interesting to note that the Dales who are tenants and serve and show the visitor round are lineal descendants of the same Richard Dale above mentioned. The place teems with interest. Here are an ancient family chapel, a musicians' gallery above the dining room

an ancient dining table at which Queen Elizabeth dined (and also our present King and Queen, by the way). Old oak panelling in rooms galore, which are priceless, old mantelpieces and oak ceilings and carving, and a most wonderful ancient ball-room at the top of the building and running its full length, in which Queen Elizabeth is reputed to have danced a minuet.

Our present King and Queen, when they visited this unique and ancient hall in early 1914, were charmed with the place, and Mrs. Dale relates that, after the luncheon, the Queen left the dining table saying, "I really must have another look at that old ball-room," and, crossing the courtyard again, visited the more ancient part and mounted the stairs to gaze anew on that wonderful old room, as so many have done for ages past.

The ancient village of Astbury, with its fine church, next claims our attention. It is on the same road, two or three miles from Moreton Hall. The village and green are picturesque, and one or two old houses of the Middle Ages are left, but the interest centres in the old Church. For the most part the structure dates from 1616.



THE ANCIENT CROSSES AT SANDBACH.

Anne of Cleves's Home.

IN sleepy, little Lewes, which few people recognise as the county town of Sussex, with such local allurements

as Brighton and Eastbourne, there exists one of the many reputed homes of Anne of Cleves. As our illustration shows, the house which the ex-queen inhabited, after her short and troubous life with her royal master, was not of a pretentious nature, but it is a picturesque pile built of stone and situated in Southover Street. The porch bears the legend "I.S. 1599," but it is



ANNE OF CLEVES'S

HOUSE AT LEWES.

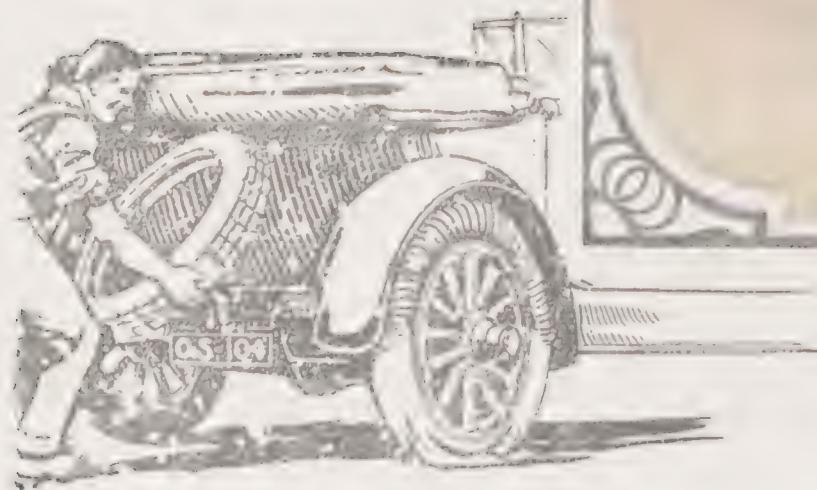
probable that some portions of the house are older. Indeed if Anne of Cleves ever lived there they must be considerably more ancient, as the fourth wife of Henry VIII. was granted the manor of Southover in 1541. It is a quaint and little-known spot in an interesting and historic town.



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The Austin

Twenty



THE MOTORIST'S CHRISTMAS STOCKING.

THE first thing that nine out of ten motorists of the feminine sex would like to find in a Christmas stocking is without doubt a new car, but so agreeable a surprise is, in present conditions, something of a stretch of the imagination, not to mention hose, Christmas stocking

though it be. The wise motorist will be more modest in her expectations, and her hopes will not exceed the bounds of elasticity.

THE STOCKING.

Consider, to begin with, the stocking itself. Many pleasant things are happening in the stocking world, both in wool and in silk. Nothing, of course, is quite so smart or so comfortable as the knitted silk sports stocking, particularly for the woman who dislikes the feel of wool against her skin. But silk is by no means the only wear, and both in comfort and smartness wool runs it very close. The newest woollen stockings show an amazing variety of patterns and colourings, from the loudest checks to the gayest harlequin lozenges. Gone are the days when a woman's feet crept in and out of her skirts timidly like little mice and to display an inch or so of ankle was the outside limit of coquetry. The bold patterns of the modern stocking were never meant to blush unseen, nor do they.

In any case, either as the container or a part of the contents, the Christmas stocking is a gift that will meet with the warm approval of the woman motorist, and she will show as much or as little of it as she chooses.

DAY AND NIGHT WATCHES.

Following the line of least resistance, from stockings one passes rapidly to clocks. It is the natural sequence of ideas. Now clocks (under which generic term watches are obviously included) are many and various. As a rule the motorist has not very much use for a grandfather clock, though it would surprise no one to see some such impressive timepiece ticking away in the corner of a saloon-limousine. Still, for ordinary practical purposes, the grandfather clock may be discarded.

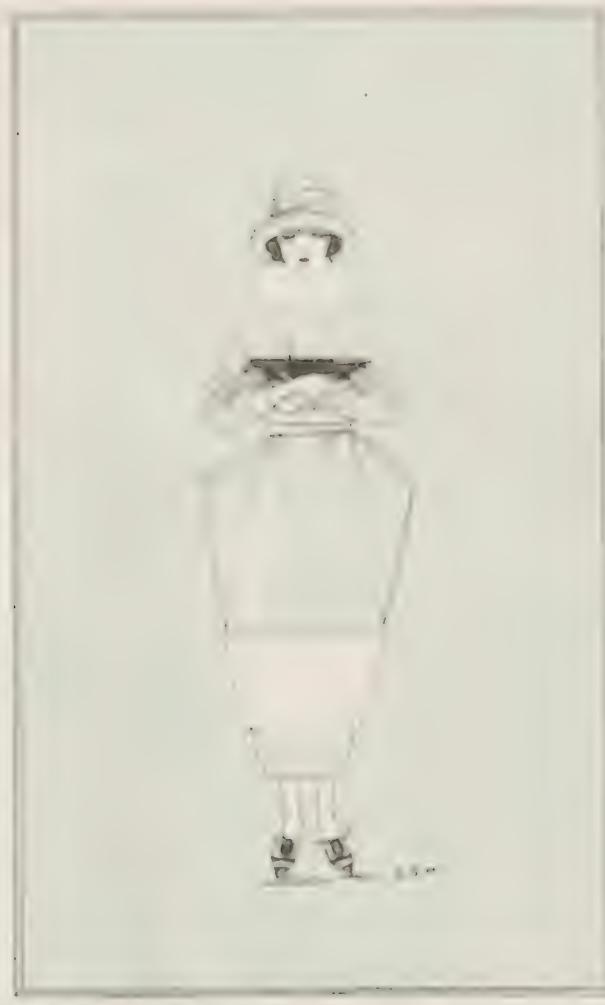
It is as well, when choosing a clock for the motorist's stocking, to bear in mind the sort of thing she is most likely to want. For the girl who drives her own two-seater through any kind of weather one would hardly, if one wished to be popular, select an elegant trifle in tortoise-shell and gold or enamel, only suitable for the interior decoration of a boudoir on wheels. The same principle applies in a lesser degree to wrist watches. But



"Armed with weapons of feminine conquest."

since the wrist watch is a luxury as well as a necessity, a more liberal interpretation is permissible. The one indis-

pensable thing in both clock and watch is a clear, strongly marked dial, with either face or numerals in luminous paint. Night has its hours as well as day, accidents may happen to the best regulated lighting systems, matches are a feeble stand-by, and where time is concerned no one likes to be in the sad position of Moses when the light went out. But, even barring accidents, the luminous dial is a convenience not to be despised.



"A new car" is what the fair motorist would like to find in her stocking.

underrated virtue still flourishes in our midst, and a very present help towards the comfortable distension of the motorist's Christmas stocking is the vanity case. It may be a mere expensive toy, a little gold or silver box just large enough to contain the indispensable powder-puff, mirror, and stick of lip salve, or it may be a miniature dressing-case of morocco fitted with everything in gold, silver, tortoiseshell or ivory necessary to sustain happiness and the pursuit of beauty during an entire week-end, but in either case it will prove a welcome gift.

Every woman motorist knows to her cost the ravages of weather, and there are times when the provision of such emergency toilet rations as a tiny pot of cold cream, a miniature bottle of eau-de-Cologne, powder, lip rouge, and a hairpin or two make all the difference between happiness and abject misery. If the vanity case be sufficiently large, a compact manicure set will prove a valuable addition to its resources. Armed with such weapons of feminine conquest, there is no hazard and no contingency of the road that the woman motorist will not face with equanimity.

VANITY AND AIDS THERETO.

When the preacher declared that all is vanity, his prophetic vision doubtless included the woman of to-day with her of his own time. Certainly that much

A WELL-STOCKED STOCKING.

No stocking will be the worse for counting amongst its contents such useful gifts as a small engagement or memorandum book, an address book with space for elusive telephone numbers, and a tiny diary. Some women have a truly masculine mania for keeping accounts, and to these a tiny notebook in which to jot down casual expenses will be welcome. For the motorist expecting to travel abroad, a pocket book with space for passport, driving licence and other necessary papers will be a suitable gift. If, without undue stretching of its capacity, room can be found for a small writing case or correspondence blotter, accompanied by the ever-useful fountain pen, great will be the joy of the motorist to whom letter-writing is not a lost art. And to fill up any chinks that remain, are there not gloves of wool and wash-leather, veils and pocket-handkerchiefs?

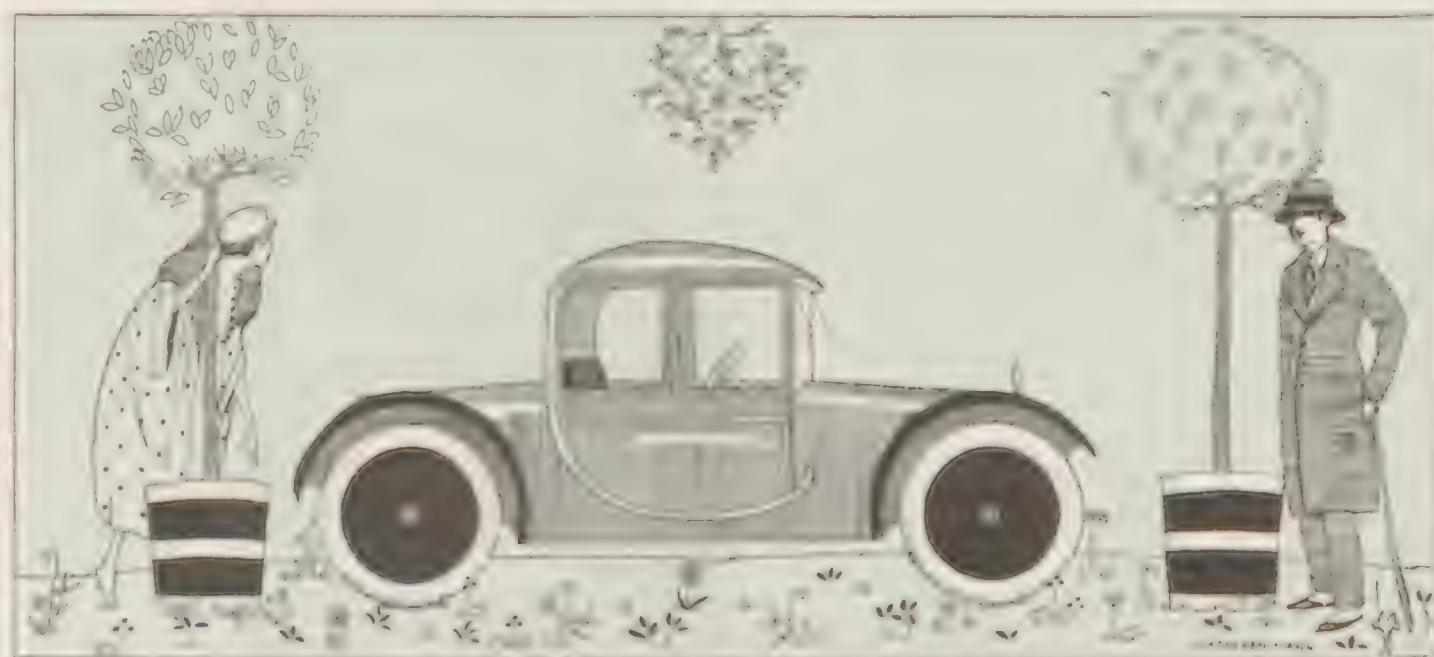
The result may not be so shapely as that achieved by the stocking in or on its natural habitat, but what of that? Consider, O filler of stockings, the Christmas joy of the recipient, and prepare to earn the gratitude of the woman motorist.

BOADICEA.

Innocent Purchasers.

IN a case recently investigated by the Automobile Association the sum of £400 was recovered for a member from the vendor of a car which was subsequently seized by the police as stolen property. A number of similar cases have recently been brought to the notice of the A.A. Legal Department, in which persons, acting quite innocently, have purchased cars and motor-cycles which have come into the hands of previous owners in an irregular manner.

Unfortunately, although the vendor of the stolen car may be quite innocent, the mere fact that he sells the car to another party may render him liable to that party for the return of the amount paid. Both motorists and dealers cannot be too strongly advised when purchasing second-hand cars or motor-cycles to satisfy themselves that they are obtaining a good title to the vehicle in question. It is difficult to lay down suggestions which would apply to all cases, but where there is the slightest doubt, such simple precautions as (a) the verification of the registration, (b) production of the vendor's receipt from the previous



"A boudoir on wheels."

owner, (c) production of the local taxation licence, etc., might save a would-be purchaser from considerable loss and inconvenience.

AN
OBSERVERAT THE
SHOW.

By MAX PEMBERTON.

ANY candid opinion expressed upon the Motor Show of 1919 should be prefaced by a word of gratification. Whatever we may think of the immediate prospects of our industry ; however much we may complain about certain phases of it, the fact that the Show is once more in existence cannot be recorded without gratitude. It is in our world the reanimation of the almost lifeless body, the passing from the dark to the light, the joyous resumption of an ancient pilgrimage. Nor, when acclaiming it, should we hesitate to say that in point of mere beauty this present Exhibition can rarely have been surpassed.

All this being readily admitted, it is possible to arrive at the candour demanded. For my part, the first impression recorded was one of gorgeous unreality. The famous South Sea Bubble was accompanied, as we remember, by many promises of schemes presently to be disclosed, and these were capitalised with a sublime faith in the integrity of their proposers. While nobody would compare for a moment the good and proved faith of our own manufacturers with the rascalities of the Eighteenth Century, yet it is impossible not to feel that much of their endeavour is in a nebulous condition and that time alone will order it. These schemes are, in a sense, "presently to be disclosed." Meanwhile the agent, pencil and notebook in hand, cheerfully promises these cars which he knows in many cases he will be unable to deliver.

So there was the unreality of it all. Just as the dilettante strolls into a picture gallery in Bond Street and views great paintings which there is no possibility of purchasing ; so must many an old motorist have gone to Olympia and admired these wonderful contraptions in

silver and steel with which perspiring showmen endeavoured to entertain him. If he were a critic, the shimmer of it all did not blind him to many obvious facts. He perceived work that was magnificent and work that was scamped. There were bodies which should never have been allowed to leave the factory ; others so wonderful that they must have wrecked the happiness of homes. All this was apparent even to the merely well-informed. It remained for some of us to try to get down to bedrock and to ascertain just what this wonderful Show had taught us.

And first, as to novelty. What was there at Olympia which was absolutely new ? Shall we name the cars with many cylinders—the twelve-cylindered Lancia, the Delage, the Talbot-Darracq ; the complete adoption of the six-cylindered fashion by Daimler ; the little cars of the same school—well, assuredly there is nothing new here. We were talking of twelve-cylindered cars before the war, and some of us had written of them. The eight-cylindered Cadillac had impressed us, and as for little "Sixes," why, the Delaunay-Belleville people were supplying us with those before Adam grew a beard. So in this mere multiplication of cylinders is there nothing to set the Thames on fire.

What we do have to admit is a greater cleverness in the carburettion of such engines, and the almost universal success which now attends their performance. In the old days, many a man who boasted of a "Six" would admit to you in a dark corner that he rarely had more than five cylinders firing ; but that is all behind us, and one of the lessons of the year has been well learned by those who now design these many-cylindered engines. Whether they are really so very much better than the best

of the old fours ; whether a conservatism which still announces that a four-cylindered engine is the stand-by of this or that firm, is to be encouraged, is a point which may be argued upon some future occasion. But for the moment fashion says " Give us many cylinders," and the makers are bowing gracefully to the demand.

* * * * *

My second impression of Olympia was one of magnificence. I have never seen in my life more handsome carriages. The vast bonnet and dash of the Rolls-Royce must stagger even the most gilded of youths. So greatly did it fire the ambition of many of the spectators, that one lady who took possession of the wheel of that particular car was, I understand, ejected with difficulty. Elsewhere the same grandeur was to be observed. Superb Wolseleys and Daimlers, Sunbeams and Crossleys, Austins and Armstrong-Siddeleys, Lancasters and Lancias, pointed to this fashion of covert magnificence, which is in keeping with what we read of the luxuriance of the times.

To-day there would seem to be but two styles of bodies which really count—one the coupé-limousine ; the other the sporting four or five-seater. The latter now often disdains doors altogether ; or if it possess them, they are mere mockeries. Seats deep down in quaint wells invite the traveller to disappear from the public gaze, and safe upon a good floor, to be hurled through the air at the discretion of the driver. No longer do we hear any protest at this retrogression from the comfort of the older types ; nor does anybody now dare to suggest that those in the rear seats of the sporting type need the protection we used to demand for them.

All, it would seem to me, is sacrificed to a speed often undesirable and to a gospel which takes heed of nothing else but the mood of a sporting day. Vain would it be to occupy an unpopular pulpit and to point out some of the things we have lost ; to hint at the advantages of a reasonable altitude ; to decry that abasement which rates us lower than the hedges and shuts from us all possible enjoyment of the country in which we travel. Yet honesty, though it be ancient, must contend that many a historical chariot could give points to the sporting model where all these things are concerned ; and the woman who rode in the five-seated car, say, of 1905, went in vastly

more comfort than her younger sister whom the boy now drives to Bournemouth at fifty miles an hour.

All this is ridiculously old-fashioned—let us admit it—but possibly it is not far from the truth. Certainly it is an impression of Olympia. We are asked to admire so much that is merely new, that many of us have fallen into the habit of doing so on demand. Yet there is another side to most of the pictures, and some of them invite plain speaking.

Take, for instance, this question of what is called the left-hand drive, *i.e.*, this fashion of placing the wheel on the left-hand side of the car. Some of us do not hesitate to style it an absolutely dangerous practice ; nor are we surprised to hear that a proposal to forbid it is already debated by Authority. America, as we know, is profoundly indifferent to our scruples in this matter ; and we are to expect thousands of chassis next year with the wheels upon the left-hand side. What we shall do about it remains to be seen ; but that the practice is a menace to the safety of us all, I myself have no doubt whatever. If we are to have cars driven from the left, then assuredly should we first alter the rule of our road and adopt that of our French and American brethren.

My last impression of Olympia was of the wealth of the populace. There must be thousands of rich men in this country if so many chassis can be listed at a thousand pounds. What would happen nowadays to a person who approached one of these magnificent showmen and said that he had £250 to spend, St. Christopher alone can tell us. There were cars to be had, it is true, from three or four hundred pounds upwards ; but they are in a great minority. Generally speaking, the Show catered for the supposed plenitude of modest persons with a couple of thousand pounds in their pockets. Whether there be quite so many of these as the British manufacturer supposes, I do not pretend to say. We are told that money is being made at a great rate by the Government printing presses, and possibly a good deal of this interesting paper is floating about the motoring world. But whether the end will justify the price remains to be seen ; as does the fact of that American competition with which we shall have to reckon seriously next year.

For all this, it was a great and splendid Show, and the electric light was really wonderful.

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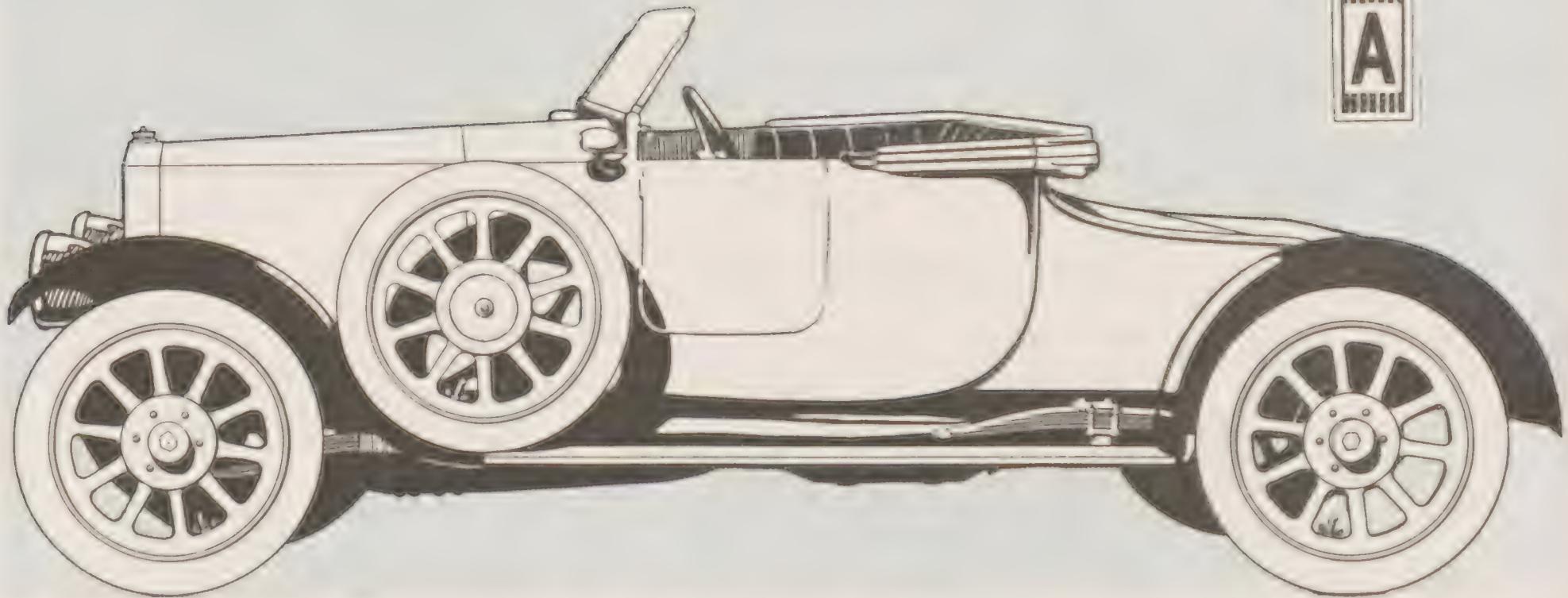
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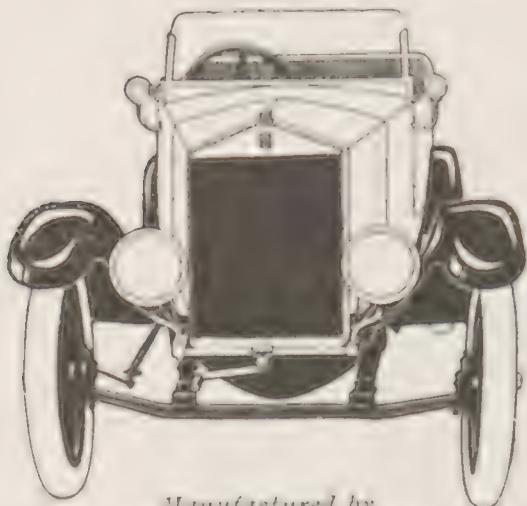
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THE LURE OF THE WINTRY WORLD.

FLOODS cannot quench enthusiasm. Gales are powerless to destroy the spirit of the man whose soul is on fire with the passion of achievement; and there is something in photography, for the man who loves it, that will enable him to conquer the reluctance that is born when comforts within form an alliance of dissuasion with inclemency without.

Snowdrifts piled against the door and gales that wail their way about the house may add a cheerier glow to the fire, and a new winsomeness to the quiet pursuits of home; but nature's austerest moods have their priceless opportunities, and the gales and storms possess choice jewels for those who can appraise them well. And there are days when we must go forth, be the weather what it may. These are not days when the camera may be lightly left at home.

The woodlands, when the boughs are bare and leafless, have a beauty of their own. The winter sunlight gleaming through the undraped branches will turn into a picture of delight the deep valley or secluded grove, which in summer verdure is a haunt of gloom, casting defiance at film and lens. The rain-swept roads form a mirror for the light, revealing to the photographic plate details that at other times and in other circumstances are altogether lost.

Visions, too, may be seen of distant hill or far-off scenery that are hidden from our view when the trees are clad in their cloak of green; and if the eye is indifferently charmed by reason of the



apparent colourlessness of winter's pageantry, by comparison with summer's glory, it will be found that the photograph, which ignores the rainbow hues and deals only with tone values, will often give a more pleasing picture in the year's dead days.

But the opportunity of the winter lies *par excellence* in its snowfalls; for then a unique and matchless beauty is given to the common things of the world. Should a heavy fall have spread its covering over the land by night and the morning sun gleam out in brilliance, there is a chance that one dare not lose; nor may laggard disinclination check our enthusiasm for an hour. All too soon the snow that clings to branch and twig will melt, all too soon the gentlest winds may take the glory from the scene. If the effort be great to face the cold and deterrent whiteness of the scene, the reward will be more than sufficient to atone for any sacrifice or discomfort that may be endured.

Snow scenes are among the most beautiful that the camera can produce and it is worth while to take one's course along narrow lanes and even woodland paths, on to the moors and among the hill-tracks, into the farmlands and beside the frozen rivers to see the wonders that have been wrought by the sparkling pall of snow.

But let the photographer bear in mind that the brightness of the sunlight on the snow is not the brightness of the summer sun, though it dazzle the eye, for the sunlight itself has less actinic power in winter, and to shorten the exposure to the summer minimum will often mean a wasted plate. Care, too, must be taken in development, for cold delays chemical action. Solutions warmed to sixty degrees will often make an excellent negative where a low temperature would fail.

But taken all in all winter photography is, for the motorist, a fascinating, if courageous, sport.

CHRISTOPHER WENLOCK.



THE CARE OF THE CAR.

By CAPT. E. DE NORMANVILLE, R.E.

THE care of a car should be not merely a question of practical economy, but also a matter of interest to the motor-owner. Some motorists "make a hobby of it." It is unfortunate that their example is not more generally imitated. The subject is full of interest, and no hobby could be more remunerative. It will not be amiss, therefore, briefly to recapitulate some of the leading headings under which economical running conditions may be ensured.

In the first place, there are two main divisions in regard to the question of driving. There is the owner who drives the car himself, and there is the chauffeur who is paid to look after it. It is only in accordance with human nature that the former should be keener in looking to the welfare of the car than the latter. Nevertheless there are many chauffeurs who are most commendable in this respect, and take an honourable pride in their work and its implied trust. So far as the actual economy in running and maintenance is concerned, the remarks to be offered apply equally to both types.

ECONOMIES IN RUNNING.

There are several little economies in the running of a car which are not practised so frequently as they should be. For instance, when one is out shopping or calling, how often is the motor left running, with the car stationary, for ten minutes or even longer? This practice is reprehensible. To a large extent it is a habit. In the olden days it was frequently difficult to restart the engine. In the early period of the electrical starting apparatus moreover, one conserved the use of the fitment with a certain measure of justification. Now, however, it is a thoroughly reliable apparatus with a good life, and is by no means so liable to get out of order. Whilst an electrical self-starting apparatus must not be abused, there is now no reason for refraining from using it just so frequently as circumstances dictate. Therefore, if a visit is going to occupy more than a minute or so, do not leave the engine running.

Another small economy in fuel consumption is found in regard to starting up for the first trip of the day. When an engine is cold, or nearly so, vaporisation of the fuel is incomplete. In such circumstances, the running of an engine is the reverse of economical, as quite appreciable quantities of the spirit get into the cylinder in a liquid state. When starting off for the first trip of the day, the driver should let the engine run slowly for two or three minutes, so as to warm it up. If a rug or coat is thrown over the radiator, so much the better.

Much less waste of fuel is entailed in reaching the necessary degree of warmth for proper vaporisation, in this way, than by warming up the engine under load. This

practice is particularly valuable in cold weather, and more so—at all times—with benzole than with petrol.

TOURING SPEED.

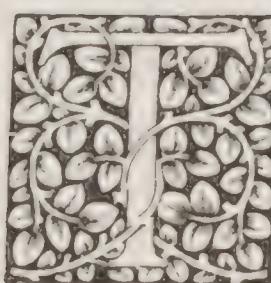
Every car has an economical running speed. Granted that one desires a reasonable touring speed, the period of economy to meet such demand is usually about 70 per cent. to 80 per cent. of the maximum speed on the level. If, therefore, a car can touch 45 m.p.h. on a level road the economical touring speed should be from 30 to 35 miles an hour. A small increase upon the latter figure means a considerable increase in fuel consumption and the wear of the tyres. The same state of affairs obtains in regard to the other units of the chassis, so that one should make a practice of employing touring speeds comfortably within the maximum speed attainable. The car will wear better, and retain its pristine quietude much longer.

As a general rule, the carburetter gives a good indication of this economical touring speed. It is difficult to explain in words, but every experienced driver knows the period during which the s-s-s-s-h of the carburetter corresponds with a generally happy state of progress. The car is getting along merrily; there is a comfortable reserve of throttle depression; and the generally subdued hum of mechanical movement has a happy, contented rhythm. Nothing is forced. Nothing is pushed. Nothing is "all out." That is the state of affairs which the careful motorist should endeavour to attain.

USE AND ABUSE OF BRAKES.

Brakes are wonderful things. Whether on tram, train, or car they fascinate the operator, with the result that they are always used too powerfully. There is no greater enemy, however, to the proper care of the car and its economical performance. The driver should endeavour to look upon the brakes from a new standpoint. They should not be considered as the sole means of stopping the car. If they are used as the final touch for arresting progress in all cases where it is not necessary to use them more powerfully, it will have a most beneficial effect on the car's life. So far as is reasonably practicable, allow the car to slow down naturally; then gently apply the brakes to arrest it finally at the desired spot.

It is always worth remembering that too vigorous brake application is bound to have a bad effect on the car. In the first place all the stresses are reversed. This is very damaging to the quiet and efficient operation of the universal joints. Though to some degree curious, it is none the less a fact that, so soon as the universal joints begin to get noisy, the rest of the chassis follows suit. One cannot too strongly emphasise the value of careful handling of the brakes, in regard to keeping down noises and maintenance costs.



THE BLUE MOON.

By R. T. NICHOLSON. Illustrated
by KATHARINE CLAUSEN.

"The Moon Car is now on the Market."

Do you remember how we found our way
(And lost it) down the lanes that afternoon?
Do you remember where we went astray?—
Once in a blue Moon.

And how the engine answered to a touch?
And how its hum seemed like an angel's croon?
And how we two said little—meaning much?—
Once in a blue Moon.

And how the sunset glowed across the hill?
And how the mist lay white along the dune?
And how you spoke the word that made me thrill?—
Once in a blue Moon.

O kindly Fate, that brought that "perfect day,"
Grant us another! Prithee bring it soon!
But Fate laughs back: (Fate has a mocking way)!—
"Once in a blue Moon!"



A Kentish Village.



THE BUTCHER'S SHOP AT BRENCHLEY.

THOUGH Kent is one of the three counties most favoured by motorists (the other two being Sussex and Surrey) it has several picturesque villages that are little known to the average tourist, either for the reason that they are not on the main road, or that they have nothing of sufficient interest to bring them to the public notice.

Brenchley, on the road between Tonbridge and Horsmonden, is a small picturesque village, of old-world appearance, in practically the same condition as it was in Elizabeth's time. It lies in a very fertile part of the country, in the midst of the orchards and hop gardens of "this England in whose crown our Kent is the Fairest Jewel."

There are several fine timbered houses of the 14th century, but the old-world appearance of the village is marred, unluckily, by a very modern looking inn.

Once, long ago, Brenchley was evidently a place of some importance, as there are traces of a castle near the clump of trees known as Brenchley Toll.

In 1703, Brenchley suffered severely in the great gale that swept over the country; the spire of the church, "a stately steeple, whose altitude exceeded almost all in Kent," was blown down, and "made sport and pastime of boys and girls, who in future ages, though perhaps incredibly, yet can boast they leaped over such a steeple."

There is hardly a corner in Kent that is not associated with Charles



IN THE CENTRE OF THE VILLAGE.

Dickens in some form or other, and Brenchley is said to be the "small town not far from the railway" where Carker met his terrible death in "Dombey and Son."

Strangers to this part of the country are amazed at the great numbers of oast houses which abound in every village; up hill, and down dale; but of the half-dozen hop counties in which hops are grown from a business point of view, Kent stands easily first, with between thirty and forty thousand acres under cultivation.

Shops of any kind are not usually associated with anything picturesque, but in Brenchley even the butcher's shop is an old timbered house, standing near the church porch, with an oast house just beyond it.



A 14th CENTURY HOUSE.

THE MODERN DARRACQ.

WHILE the name Darracq undoubtedly endows any product launched under that designation with a certain degree of interest, the new Darracq has not to depend upon reflected lustre for its appeal. It is intrinsically interesting; by its ultra-modernity of design it stands out among its many worthy compeers as a truly representative 1920 vehicle. Embodied in the one chassis are the majority of just those points which the motorist has been taught to regard as characteristic of post-war automobile engineering practice—not merely one up-to-date feature, sufficient to distinguish a new-season car from its immediate predecessor, but a whole series of such features. All too frequently that one distinguishing mark takes the form of the adoption of electric starting and lighting, the remainder of the chassis being an unaltered 1914 model.

The Talbot-Darracq, to give the *ci-devant* French car its new style, possesses a complete electrical system as a matter of course, but one has only to observe the careful enclosure of the starting mechanism to realise that both the starting motor and the Delco generator were allowed

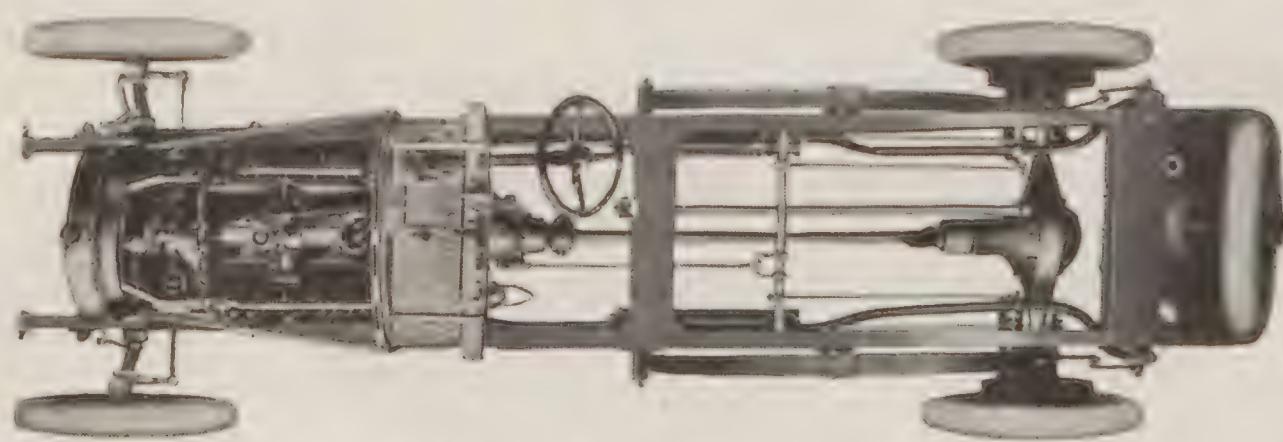
mobile prophets believe that the doom of the magneto has sounded, and that a year or so will see its complete disappearance from our chassis. However that may be, it has already disappeared from the Darracq, wherein the car is at least up to date, if not even ahead of its time.

Two models are being standardised, the more interesting naturally being the eight-cylinder 20 h.p. vehicle. A multiplicity of cylinders beyond four is in itself a modern symptom, but so far as Darracq cars are concerned,

motorists will probably remember that the record of 122⁵/₈ miles an hour for two miles was put up by Demogeot in 1906 on a 200-h.p., eight-cylinder Darracq. The new car, with bore and stroke of 75 mm. by 130 mm., while nominally having only one-tenth of

the power of that racer, can show over 60 h.p. at 2,000 revs., and in a contest with the larger vehicle probably would not require quite so long a start as at first sight might appear.

Unit construction of engine and gear-box almost go without saying as a part of the new Darracq design, while extreme neatness in engine appearance is gained by the casting of the inlet and exhaust leads within the cylinder blocks.



A PLAN VIEW OF THE CHASSIS.



THE 8-CYL. 20 H.P. TALBOT-DARRACQ.

for in the drawing-board stage of design, and were not added after the chassis had become a *sait accompli*. The Talbot-Darracq installation is more notable, however, than the majority of such systems, in that it provides for ignition, as well as starting and lighting, without the use of a separate magneto for this purpose. Certain auto-

The second Talbot-Darracq model is a 16 h.p. four-cylinder vehicle, of the type largely used by the French military authorities. The car is new to the public, but the fact that it has survived the cruel testing of the war vouches for its satisfactory performance of far less arduous private service.

A CAR WITH POINTS.

IT is difficult to know where to begin in attempting to describe the new Hispano-Suiza car. The chassis, from the front dumb-irons to the differential inspection plate, abounds with details of construction which differentiate it from all other cars in general, and especially from previous Hispano-Suiza models. First and foremost,

drum. When the driver depresses the brake-pedal, however, the shoes grip the drum, which then endeavours to carry the centre shaft around with it. Thus, the slight pressure necessary to secure the operation of a single small brake is made to re-act on the whole system. Provision is made so that failure of this ingenious mechanism shall not render the brakes inoperative; and a side-lever connected only with the rear-wheel brakes provides a further element of safety.

In a car embodying so many unusual features, one is somewhat surprised to find that semi-elliptic springs are relied upon for suspension throughout; but the makers of the Hispano-Suiza appear to have gained by sound design—such as great length, many very thin leaves, double shackling of the rear springs, underslinging and so forth—what



Side view of the Hispano-Suiza.

the new car, instead of being a "15.9," has six 100 mm. by 140 mm. cylinders. These are formed from a single aluminium casting, steel liners providing the actual cylinder-walls. An over-head camshaft and valves, tubular connecting rods and aluminium pistons, magneto-less ignition (the Delco starting, lighting and ignition system being installed), and two sparking-plugs per cylinder, with two separate distributors, are among other departures from convention in the power-plant alone.

Apart from the engine, probably the most interesting feature of the chassis is the braking system—and this not only because front wheel brakes are employed. The greater novelty lies in the method by which the brakes are applied. Primarily, the brakes on all four wheels are operated by a single pedal, but instead of having to throw all his weight on to this pedal to secure the maximum amount of retardation, the driver of the new Hispano-Suiza uses about the same amount of force on the four-wheel brake-pedal as that which the accelerator requires. This small effort is magnified manifold by the patent "Servobrake," which, briefly, consists of a helically-driven tubular cross-shaft, carrying a brake-drum, immediately behind the gear-box. Through this tubular shaft passes another shaft, carrying brake-shoes, and in direct connection with the ordinary brake-operating mechanism. The tubular shaft revolves at 1-64th engine speed and normally the shoes on the centre shaft are free from the revolving

Two views of the engine.



is occasionally secured by the employment of devices which embody a greater degree of complication.

THE GOLFING MOTORIST.—By R. ENDERSBY HOWARD.

VERY happily situated at this time of the year is the golfer with a car. Like every other individual who finds physical recreation and a perennial source of fitness in weekly rounds of the links, he desires above all things to play on dry courses, where the ball sits up temptingly for every shot, and the turf gives a measure of elasticity to the tread. Golf in the mud may be better than no golf at all. Most of us have suffered its trials in the quest of its pleasure; we have scattered wormcasts to the four winds of heaven in the execution of our strokes, we have gone down embankments to look for a ball with the lank, damp grass clinging round our ankles, we have slipped in the quagmire, we have dug our once pure-white rubber core out of the morass.

Alas! clay—that incorrigible producer of mud in the wet seasons—seems to be the chief constituent of this great little country. During the past ten or fifteen years a goodly number of sandy and gravelly tracks of land have been discovered and turned to account as centres of golf, but they are not nearly enough to meet the demand for dry winter courses. Consequently, those which are easily accessible are apt to become uncomfortably full at week-ends. The good fortune of the car-owning golfer is that he can reach the less accessible places without bother, and play his rounds without the discomforts of either mud or overcrowding.

Of late I have visited two courses of this description—Camberley Heath and Frilford Heath. Both are of the character of Sunningdale, Walton Heath, and Swinley Forest—fine open expanses of sandy country with fairways carved through the heather. They were instituted in 1914 (almost might they be called war-babies), and they have not yet been found out by the multitude. They will be famous in the fulness of time, but the relative remoteness of their locale will save them from the penalties of excessive popularity. They have strong memberships, and ever increasing numbers of visitors from the ranks of golfing motorists, and they would ask no more.

The entrance to the Camberley Heath course is at the twenty-ninth milestone from London on the Portsmouth Road, half-way between those ancient ruins, the Jolly Farmer, Bagshot, and the White Hart, Frimley. From the club-house windows and the higher parts of the course, the views are so beautiful as almost to make you break with the stalwarts who say: "Hang the scenery, sir! Scenery is not golf." To be sure, it is not; but when it is of the kind that meets the eye here, it constitutes a very alluring adjunct. For miles and miles stretch wooded valleys and open downs; such a panorama of the countryside as presents itself on no other course that I know. It is claimed that,

on a clear day, you can see Ingpen Beacon, in the Salisbury district.

In its general characteristics, Camberley Heath puts one very much in mind of Sunningdale, although I would say that there is less chance of scraping a lucky half than at the latter place. The fairways are narrower, and the side-bunkers hug the greens rather more closely than at Sunningdale. Still, there is nothing to instil fear into the most moderate player; the heather on the flanks is only just

long enough to punish an errant shot without wrecking one's chance of halving the hole, and the main necessity is to steer a straight course so as to keep open the approaches to the greens.

THE CLUB-HOUSE
AND HOME GREEN
AT CAMBERLEY
HEATH.



(Above)
A TYPICAL
GREEN AT
FRIFFORD
HEATH.

(Below)
DRIVING
FROM THE
15th TEE AT
CAMBERLEY
HEATH

A hole that impresses itself deeply on the mind is the third, measuring 500 yards. The drive has to carry 130 yards over heather, but as it is played in the direction of the prevailing wind—south-west—it needs only an ordinarily clean shot. One question that arises, however, is as to whether one shall place it to the left or to the right. Somehow, the left looks the more tempting line, but it leaves another problem—that of carrying the long, low, heather-clad hill which stretches across the fairway from

the left to within a few yards of the rough on the right. On the whole, it is better, probably, to drive to the right, so as to simplify the second carry over the hill, and also avoid the awkward bunker which obtrudes on the left of the green and offers itself for very deep consideration if you are proceeding up the port side of the course.

The sixth is as good an example as I know of a drive and pitch hole. You approach on to a green which is hemmed in with bunkers, and, if you have not taken the precaution of avoiding the left with your drive, the chances are that the approach will not stop anywhere near the hole. Every hole has its own character, and the finish is splendid. The last four holes demand a series of truly "thinking" shots, with the seventeenth (422 yards) as the supreme test. A deep ravine eats into the right-hand side of the fairway, and the player who slices must carry this ravine with his second shot—a rare trial when the match is a close one. The green is situated on the end of a promontory leading down sheer to the ravine, so that even if you have driven safely to the left and secured an open second shot, you must be wary of a slice, or the ball may be swallowed up in this ravine of perdition. Altogether, an exceptionally fine hole.

Frilford Heath (adjoining the crossing of the main road from Oxford to Wantage) is another expanse of sand and heather, where once the rabbits held undisputed sway. Occasionally, even now, you find their scrapes amid the vegetation, but they have been virtually exterminated, and the land has been diverted to the purpose for which nature must have intended it. There are some wonderful natural holes at Frilford Heath, as, for instance, the third and seventeenth, and the only word of adverse criticism which one feels disposed to put forward in regard to the course concerns the condition of the putting greens. They lack that velvety smoothness which the golfer hopes to find when he comes to the delicate business of putting; they have a suggestion of bareness and lack of nourishment. Still, it has been a hard struggle during the past five years to maintain in first-class order even the course that enjoys, as this one does, every dispensation that providence can bestow, and I dare say that the process of perfecting the greens is merely a matter of time.

The third is a hole of 176 yards, presenting an awe-inspiring tee-shot, with a big, deep wood hard by the line on the left and its chief feature, a large pine tree, spreading its branches even into the line. You have to carry these branches in order to reach the green. If you pull a little, you are well into the thick of the timber, and if you slice,

there are sufficient trees to create a succession of interesting sounds as the ball makes its way down from branch to branch. The seventeenth is a dog-legged hole which brings into effect the scheme of the diagonal hazard. That is to say, from the tee round the corner, you have to carry boggy country, bushes, and a wall, and before starting, you have to decide just how much of this formidable array—which skirts the left of the fairway—you are capable of carrying.

If you get in a good shot, there is no reason why you should not reach the green with your second; but if you take a safe line so as to avoid the conglomeration of trouble, you will need three shots at least before you start to putt. It is an advantage here not to have the honour; it is nice to see what the other man does before you fix upon your own policy. That is one of the charms of the hole for either party.

War Souvenirs.

ALTHOUGH the fact is well known that all our great motor-car manufacturing concerns entirely suspended their normal operations and devoted themselves to war work in one form or another during the recent conflict, the average motorist probably has a very inadequate conception of the variety of activities comprised in the production of munitions. As a matter of historic record, therefore, at least two great firms—the combined B.S.A. and Daimler companies, and Ruston and Hornsby—have compiled admirable souvenirs of their late work which will prove enlightening to those who know these firms only as automobile and general engineers.

As a record of rapid work it is interesting to note that the first Daimler-Gnome 80-h.p.

aero engine was actually running in one hour less than eight weeks from the start of manufacture, although working drawings had to be made from a dismantled engine and the quality of material required determined by analysis.

The varied nature of Ruston and Hornsby's war work is rather startling. The album is divided into three sections, covering the war on land, on and under the sea, and in the air. In the first section everything from a trench cart to a 12-inch gun mounting is illustrated; the second includes such widely-separated productions as mine-sweeping paravanes and 1,200-h.p. submarine engines; while the third section shows some of the types of the 2,750 complete aeroplanes that were made.



A PUTT FROM A CORNER OF
THE 11th GREEN AT CAMBERLEY.

SUSPENSION VARIETIES.

SUSPENSION provides more variety in design than any other detail of the complete motor-car. There are certain systems, it is true, which are a little more numerically popular than others, but among the one hundred and twenty odd different makes of automobile at Olympia at least twenty different systems of springing were distinguishable. Cantilever rear-springs, in one form or another, accounted for some 35 per cent. of the whole; but it was significant of the fluidity of opinion among chassis designers that even where the same general type of springing had been adopted by three or four makers, there were sufficient detail divergencies to individualise the suspension of each make.

Cantilever springs alone, for instance, provided some nine or ten variations of the broad idea. There were cantilevers shackled forward, shackled at the rear, at both ends—and shackled not at all. In one case—on the 13-24 h.p. Unic—a full double cantilever was used, and in another—the Vermorel—a quarter-elliptic supplemented the cantilever. The majority of springs of this type were pivoted centrally, but a number of chassis—notably the four-cylinder Peugeot and the Albert, Horstman and Meteorite light cars—had their cantilevers mounted with the greater length of the spring to the rear of the pivot.

Rolls-Royce, Napier, Talbot-Darracq "Eight," Armstrong-Siddeley, British Ensign and Berliet are outstanding examples of what is probably the most general type of cantilever mounting—that is, a single shackle forward—but even among these few cars the Rolls-Royce spring with its few thick laminations differs materially from that of the Napier, with its many thin leaves; the Darracq roller rear-mounting is in a class by itself, and the Berliet cantilever plus Gabriel "snubbers" is unusual.

Minerva and Mercury cars may be mentioned as examples of the system of shackling the cantilever at the rear, while the Enfield-Allday stands alone in having full cantilevers all round, all four being shackled at both ends.

In view of the striking variety of systems of springing which has secured adoption in 1920 cars, one would have been justified in anticipating something startling in the way of novelty at Olympia, but as a matter of fact, systems which really deserved the appellation "unconventional" were remarkably few—and none of them came as an actual surprise at the show. The Overland "spring-base" had already been exploited; the Cosmos and Douglas combination of compression coil springs and levers had been illustrated in the press; and the 12-cylinder Lancia, with its semi-elliptic plus cantilever rear springing, had previously provided one of the sensations of the Paris Salon.

It may be interesting to give a list of the various classes into which fall the systems of suspension of the cars of 1920, showing also the subdivisions of each class. This list is appended, the classes being arranged approximately in order of popularity, and a few of the supporters of each system being mentioned:—

CANTILEVER :

Shackled rear—Minerva: Mercury.
Shackled forward—Armstrong-Siddeley; Berliet;
Ensign; Napier; Rolls-Royce.
Shackled both ends—Enfield-Allday.
Full double—13-24 Unic.

CANTILEVER (*continued*) :

Semi-double—Vermorel.

Pivoted ahead of centre—Albert; Horstman;
Meteorite; Peugeot.

Combined with semi-elliptic—Lancia.

SEMI-ELLIPTIC :

Shackled front—F.I.A.T.

Shackled rear—Singer; Sizaire-Berwick; Renault;
6-cylinder Peugeot.

Shackled both ends—Bianchi; Crossley; Phoenix;
S.P.A.

QUARTER ELLIPTIC :

Single—A.B.C.; G.W.K.; Hammond.
Double—Citroën; Waverley.

THREE-QUARTER ELLIPTIC :

Shackled rear only—Daimler; Delage; Marlborough; Morris; Ruston-Hornsby.
Shackled both ends—H.E.; Lorraine-Diétrich.

TRANSVERSE :

Rear, with semi-elliptic—Cadillac; Delaunay-Belle-ville.

Rear only—Bayard; 13.9 h.p. Renault.

Front only—Lagonda.

FULL ELLIPTIC :

Crouch.

LEVER-AND-SPRING COMBINATION :

C.A.R.; Douglas.

It appears to be generally recognised nowadays—more particularly in regard to semi-elliptic springs, of course—that the most satisfactory suspension is secured by the use of very long, almost flat springs made up of a great number of thin leaves; and the consensus of opinion would seem to be that by placing the springs as far apart as possible, by relieving them of all duty beyond that of suspension, and by the consequent ability to shackle them both fore and aft the best result is gained. These points, we say, have passed almost beyond the controversial stage; and yet by no means have they secured general adoption. In regard to one point alone—one of the most important it would be imagined—it is still quite a general feature of design to utilise the springs for the withstanding of torque and driving stresses. With cantilever rear springing, it is almost invariable that the springs are mounted outside the chassis and so a few inches of "spring track," to paraphrase the Overland term, are gained; but this also, in regard to other types of suspension, is a feature of design that is found only here and there. Cantilevers, again, are almost invariably long and flat, but so far as thinness of laminations is concerned, the new Rolls-Royce is a notable exception. The Mercury is very heavily cambered; its comparatively great length gives an appearance of considerable flexibility, but some type of rebound absorbing accessory appears to be a necessity.

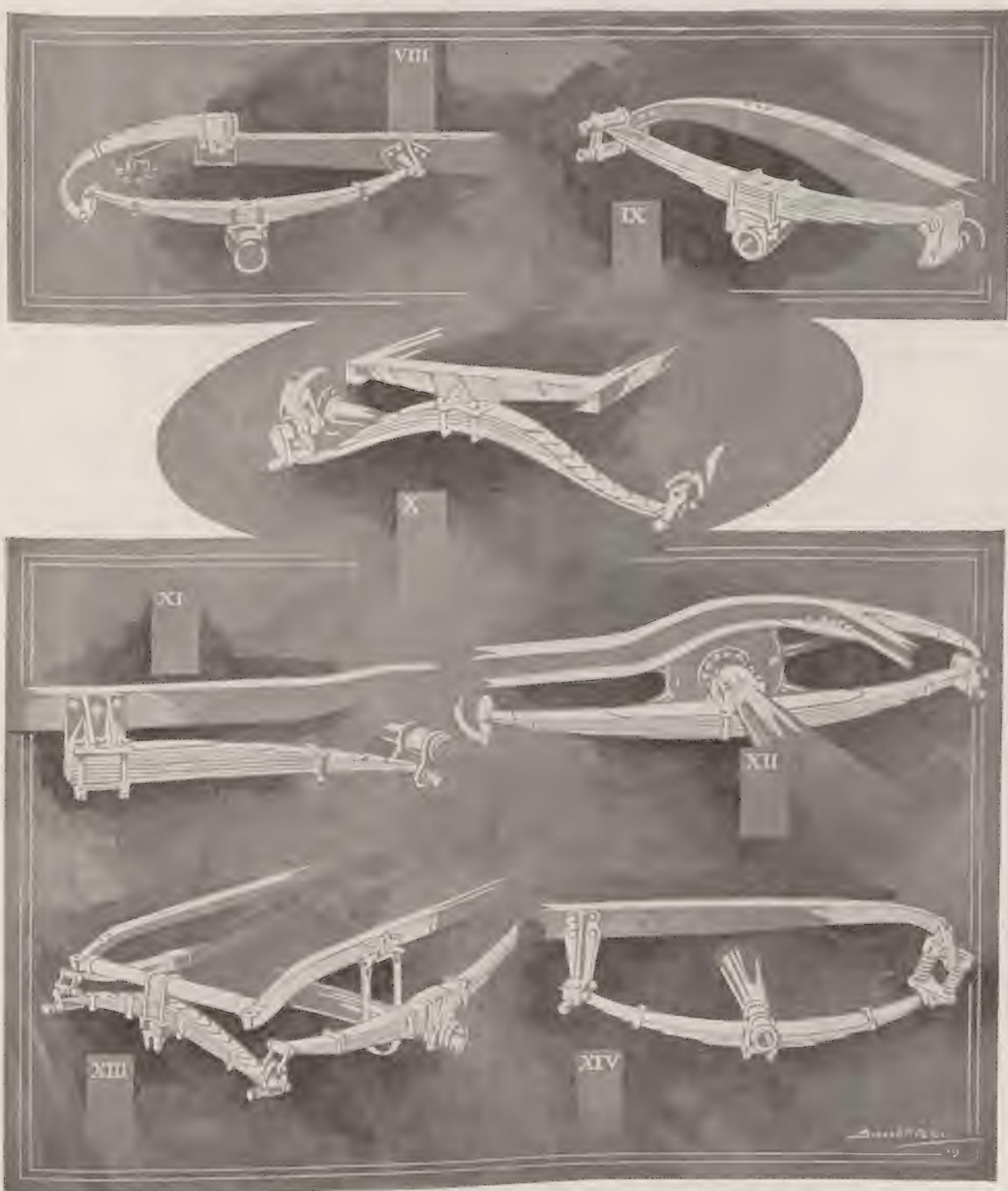
This question of rebound is one that has exercised the minds of spring-makers and chassis designers for many a year, and apparently the ideal solution is yet to be found. Quite a number of makers are fitting shock absorbers of various makes—Houdaille, Mamet, Truffault, and Gabriel—as standard to their chassis, the big Berliet, the 6-cylinder Peugeot, and the small L.M., Hammond, Singer and Marlborough being among the number. Other makers have adopted other methods, the semi-elliptic springs of the new S.P.A. being notable in having the shortest leaf on top of the spring with a view to checking rebound without a sacrifice of resilience.

Current Types of Suspension. (I.)



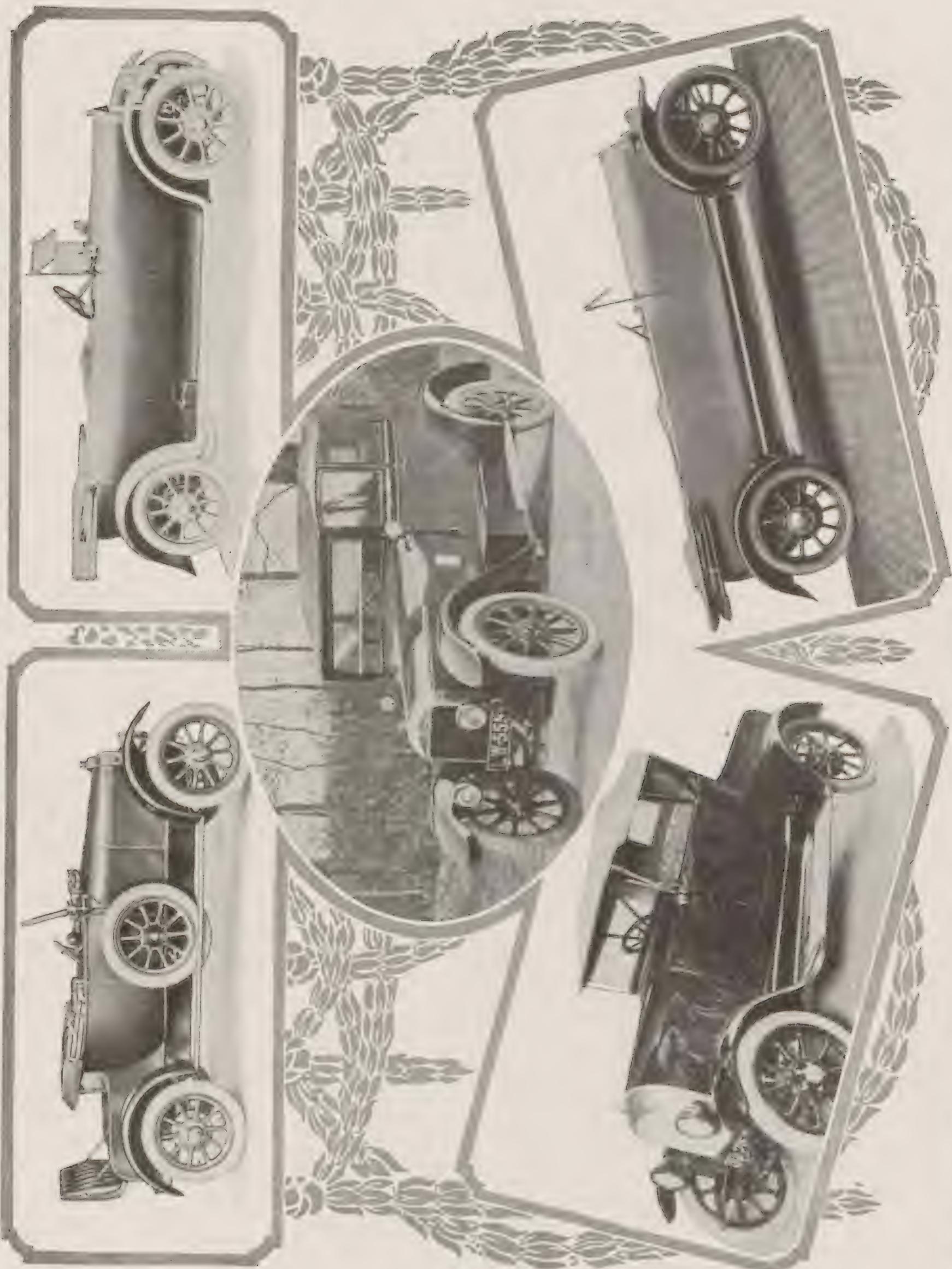
1.—The Overland "extended spring-base." 2.—The Napier flat cantilever, with anti-rolling device. 3.—The Lancia combined cantilever and semi-elliptic. 4.—The Talbot-Darracq cantilever, with ribbed leaves and roller mounting. 5.—The Unic double cantilever. 6.—The Vermorel combined cantilever and quarter-elliptic. 7.—The C.A.R. anti-friction springs.

Current Types of Suspension. (II.)



8.—The Star three-quarter elliptic. 9.—The Grégoire semi-elliptic, shackled at both ends. 10.—The Bayard transverse rear spring. 11.—The Grahame-White quarter-elliptic. 12.—The S.P.A. underslung semi-elliptic. 13.—The Cadillac transverse rear and semi-elliptic combination. 14.—The Standard semi-elliptic with shock-absorbing shackle.

SOME MEDIUM-POWERED BRITISH CARS.



*The 15 h.p. Waverley.
The 15 h.p. Calcott.
The 11.9 h.p. Dawson.*

In the above group are shown three new 15 h.p. models and two which, though rated at 11.9 h.p., are outside the light car class.

*The Wolseley 'Fifteen.'
The 15.9 h.p. Arrol-Johnston.*



IT is certain to be a gay, expensive, all-cheerful December. The New Poor, I am afraid, will continue to suffer, for prices of clothes, of jewellery, of motor-cars, wines and cigars, and most of the things that lend colour to life, continue to soar higher. But those seized by the spending craze still have the bit between their teeth, and the big shops are prepared for a Christmas turnover that will assuredly astonish the few old-fashioned people that remain amongst us. The period of public dinners and of convivial restaurant parties has set in with as big a swing as in 1913. The ballrooms gain new devotees each week. The Savoy at supper time in the big handsome room below stairs is as animated as it was just before the war and in the hectic months of 1915; and, as a fair companion remarked to me the other night, "You can't see a single dowdy dress; every woman seems to have a new gown." Ciro's has its'old touch of smart expensiveness.

The Portman Rooms, where you can see bright people and dance without having to be a member of a club, is one of the successes of the moment. The dancing boom has extended itself even to the big new building in the Strand known as "Australia House."

EXPENSIVE PLEASURES.

And if you look into things, this kind of life, though it may not always rise to the champagne and motor-car standard, is shared in by the middle classes, and on occasions by those who have come to be known as the New Poor. An eminent writer, emphasising how the middle classes have been hit by the war and by the present high cost of living, traces their plight to a disposition for the last twenty or thirty years to aim at a standard of living which has been too high, to seek expensive pleasures, and to neglect the more irksome duties of citizenship. Before the influx of South



Marchioness of Camden.

THE OPENING OF THE HUNTING SEASON: A MEET AT FRANT.

African gold, which set in motion habits of extravagance and costly living, the middle classes did not frequent luxurious restaurants, rarely sought a holiday on

the Continent, treated a visit to the theatre as an event, and certainly made domestic life more of a habit than they do now. So that the present members of the middle classes, the people who have had to realise that £5,000 a year only means about £1,500 nowadays, have found it a more difficult task to cut their coat according to their cloth than their grandfathers would have done. However, our middle classes are still the backbone of the nation, for one thing because they are continually recruited from below; let us hope that the approaching period of festivities and of New Year resolutions will bring renewed heart and a new courage to all our people.

INCREASED SUBSCRIPTIONS.

When originally an all-round increase of subscription was threatened in the Pall Mall, St. James's Street and Piccadilly Clubs old-time members grumbled loudly, talked much about mismanagement, and hinted pretty plainly that there would be many resignations. But they seem to have taken the actual decision, which in the majority of instances has meant an increase from ten to fifteen guineas yearly, with great quietness.

One shrewd club secretary forecasted the run of events thuswise: "I think the average member will accept the

proposed increase," he said, "and for this reason. If subscriptions are not raised the prices of food and drink will go up. A member will 'grouse' then every time he pays a lunch or dinner bill. With a raised subscription he will have one good grumble at the beginning of the year and be finished with it."

THE GUARDS' CLUB.

When the Guards are in full possession of their new club-house in Brook Street—formerly the building was Buckland's Hotel—it will be found that more or less permanent bedrooms will be a feature. Ordinarily club bedrooms are for members up from the country, but the dearth of housing accommodation has rather broken into that tradition. The Devonshire Club, for instance, possesses an annexe in Arlington Street, where members can secure permanent rooms; these quarters, though open only to members, are distinct from the Club bedrooms, which can only be engaged for a few nights at a time. The Services Club in Stratford Place met the needs of our New Army officers in similar fashion. The Ladies' Annexe of the Guards' Club will mark a new era in clubdom; here, again, the idea is borrowed from the Junior Army and Navy in Whitehall Court.



Uncle George (the multi-millionaire, excited, like the rest of us, about the new baby, his grand-nephew, and throwing prudence to the winds). "HE'S A GOOD 'UN! HE'S A CHIP O' THE OLD BLOCK! I'LL BUY AN OPTION ON A SIX-CYLINDER TWO-SEATER TO-DAY SO THAT IT'LL BE READY FOR HIM WHEN HE'S TWENTY-ONE, EVEN IF I'VE TO SELL HALF MY ESTATES IN BRAZIL AND ALL MY OIL SHARES!"

THE NEXT MOTOR SHOW.

Everyone who visited the Motor Show—and there were some who were just swept in with the crush and carried round the vast hall by the human tide without really seeing much of the exhibits—became agreed that next year a real effort must be made to secure greater convenience and more opportunity for the seriously prospective pur-

A MEET
OF THE

ATHERSTONE
FOXHOUNDS.



WITH THE CHESHIRE HOUNDS.

(Mr. T. H. Jackson, the second figure from the right, has hunted with the Cheshire for 64 years.)

chaser to see what the exhibiting firms had to show. The refreshment difficulties seemed insuperable, and I know one or two exhibitors who, after the first two days, took sandwiches and a flask with them. And the stories told of the old ladies who reclined half the afternoon on the big soft chairs that some of the exhibitors had supplied

for cheque-signing clients! But it was altogether an extraordinary week.

The 10/- day certainly justified itself.

MOTORS AT THE MEET.

The hunting season is now in full swing, and the motor-car, of course, is its inseparable accompaniment, as is shown by various illustrations appearing in this number of THE MOTOR-OWNER. In the very early days the automobile had its keenest opponents among the hunting fraternity, but on the other hand they were, for the most part, among the speediest to be converted. In this field, as in every other, the immense convenience of the motor vehicle was a factor which could not be ignored, and no one would think nowadays of riding a long way to a meet when he or she could send on the horses in advance

THE EASTBOURNE FOXHOUNDS.

and arrive by road. In every particular there is something gained. Instead of the scrambled breakfast at an unearthly hour, followed by a chilly ride in the damp morning air, the morning meal can be enjoyed in comfort; the start can be made hours later than of yore; the riders themselves step out of their cars perfectly fresh, and mount waiting horses which are also fresh. Incidentally it may be remarked that the motor-car has many a time and oft come in very usefully in the

case of a toss, and injured followers have been transported swiftly and easily to their own homes who would otherwise have had to be carried to the nearest cottage. It would be interesting to know, by the way, whether Lord Willoughby de Broke still maintains his ban upon motors at the meets of the North Warwickshire hounds. MARCUS.

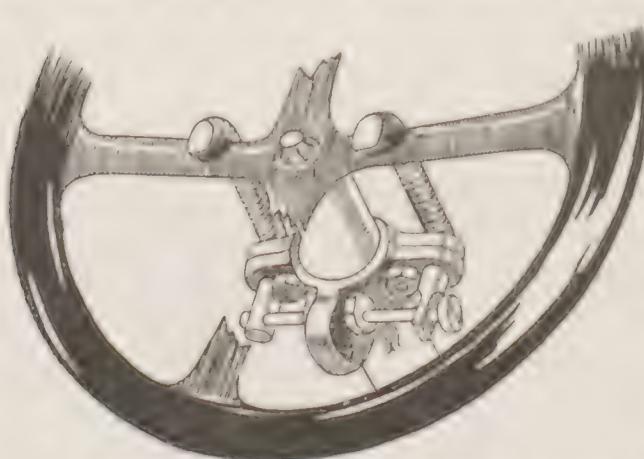
An Effective Car-Lock.

TO be effective in preventing theft it is not sufficient that a car-lock should merely interfere with the running of the vehicle under its own power, it is necessary also that an unauthorised person should be unable even to tow the car away. The Haslam car-lock, as fitted to the Grégoire-Campbell car, at Olympia, achieves this end by locking the steering wheel. Briefly the device is clamped around the steering column below the wheel; when it is desired to leave the car unattended, two swinging arms are raised into engagement with two spokes of the wheel, a Chubb lock securing them in position.

The design is such that to break the locking device would be a lengthy and laborious task and one that would daunt even the most up-to-date of car thieves. A variation of this model is made for fitting to cars on which the column revolves with the steering wheel. In this case the swinging arms engage with a



The Haslam Car-Lock.



Sketch showing the lock clamped to the steering wheel.

clip on the dash instead of lapping over the spokes of the steering wheel. The price is £3 7s. 6d.

Trade Unionism and the Private Owner.

A PROPOS to recent trade developments the following pronouncement, which the Automobile Association has just issued, will be read with interest by every private car-owner:—

Prior to the recent strike, the following Interim Notice to Members was published in the newspapers.

"The Automobile Association is watching closely the formation of the Motor Agents' Union which conceivably may affect adversely the interests of the Motor User and Consumer. The Secretary will be obliged if members will send him particulars of any incidents or developments relevant to this matter."

This referred to the announced organisation on Trade Union lines of a combine of motor agents and retailers, the expressed intention of which, according to statements in the Press, is to compel all firms in the motor industry to accept the control which TRADE UNIONISM implies.

Combines for this or that purpose are always being started, and it is no part of the A.A.'s province to interfere with them so long as they do not conflict with the interests of the private motorist. But to an organisation such as ours, control in this connection has an unpleasant flavour (*vide* Text of Rules of Motor Agents' Union 2 (a)—"to regulate and restrict such methods of trading between such motor agents and *between them and other persons*"). It pre-supposes the compulsion of

every retailer to join this body if he desires permission to trade. It pre-supposes, also, the compulsion of every manufacturer to obey its dictates if he would have the services of the retailer. The one might be denied the right to live, the other the right to reach the motoring public, if either happened to offend this (Motor Agents') Trade Union.

This may mean that if you own a car or motor-cycle the manufacturer of which, or of its principal accessories, such as tyres, etc., were involved in a dispute with this Union, the retailers who belong to it could be prevented from giving you service or supplying you with replacements.

The appointed A.A. Agent and Repairer is, of course, free to join whatever organisation he may choose. Freedom is an A.A. watchword. All that we expect, as a motor users' and consumers' organisation, is that an A.A. Agent and Repairer shall give fair value and efficient services in return for reasonable payment and *be master of his own business*.

You are asked to help your Executive to help you. It is for you, please, to make the foregoing quite clear to your local motor dealer.

It is for you, please, to watch for, and communicate fully to your nearest A.A. Area Headquarters, any development tending to prove or disprove the benefits obtained by you as a user when dealing with any firm belonging to this Trade Union of Motor Agents.

If no untoward incidents occur, so much the better. If, on the other hand, the liberty and convenience of our members as motor-car or motor-cycle users and consumers be affected adversely, no assurance is needed that the A.A., standing, as ever, for equity and fair dealing, would not hesitate to use its power in their interests, and to take any action that circumstances might render advisable to counteract such developments.

W. JOYNSON HICKS (*Chairman*).
STENSON COOKE (*Secretary*).

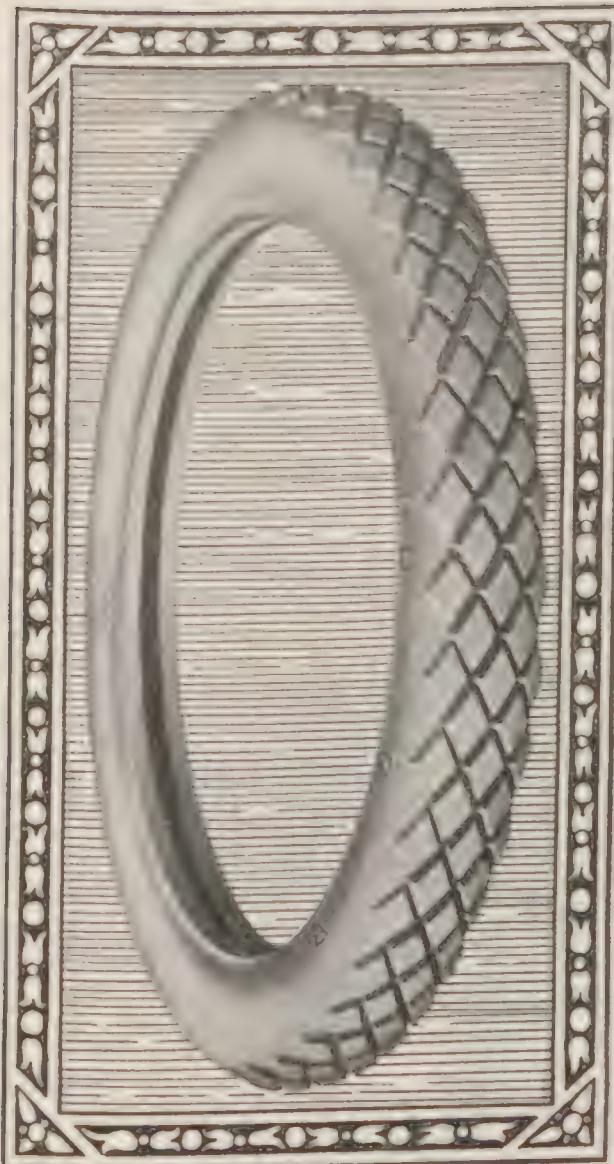
A Stiff Angle.

IT would be interesting to know what is the irreducible minimum of adhesion which is necessary for the grip of the driving wheels of a car. The "Austin Twenty" shown in the accompanying illustration is climbing Beggar's Roost Hill, a Devonshire testing spot, and stated to have a



An "Austin Twenty" on Beggar's Roost Hill.

gradient at one point of 1 in 3.6. In the course of a long motoring experience we have observed many claims to have climbed local hills of excessive severity, and we do not recollect any of a steeper authenticated gradient than 1 in 3½. In actual practice this may probably be taken as the limit of safety—at any rate for the ordinary touring motorist who does not want to find himself slipping backwards because he cannot emulate a fly on a window pane.



Goodyear All-Weather Tread for All-Winter Driving

Safety in driving and constant service from your motor car this winter depends primarily on the quality of your tyre equipment.

With Goodyear All-Weather Tread Tyres mounted on all four wheels of your car danger of delay and accident is reduced to the minimum.

Big diamond-shaped blocks of tough rubber grip the road and prevent skidding on slippery streets, or when rounding sharp corners.

And the Goodyear All-Weather Tread is economical. With only reasonable care this sturdy tyre will attain far greater mileage than you ever before achieved.

Before buying winter tyre equipment, investigate this famous Goodyear product, a tyre that runs as smoothly as a plain tread on dry roads, with a resistless grip on wet. A tread for all wheels at all seasons.



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EDINBURGH—15, Stafford Street.
PLYMOUTH—9/10, The Exchange.

BRADFORD—Halifax Commercial Bank
Chambers, Tyrrel Street.
NOTTINGHAM—4, Low Pavement.
CARDIFF—Queen's Chambers, Queen
Street.

STANDARD TOOL EQUIPMENT.

Some Possibilities of Improvement.—By CYNICUS.

WITH the gradual improvement in the reliability of the motor-car, the worries to which the owner is heir are gradually diminishing. None the less, there are still certain difficulties and troubles—admittedly of a minor character—which do not receive the general attention to which they are entitled. For example, there are questions concerning the lubrication of certain parts of a chassis, such as shackles, bearings for brake-shafts, and similar points. Then, again, there is the question of the tool-kit, with its excess of bulk and lack of standardisation. This last item appears to be one which has so far successfully eluded the vigilance of the designer. Presumably it is beneath his dignity to consider so small an item! On the other hand, it is a point which has a direct bearing on the motor-owner, though he is somewhat inclined to suffer in silence.

It is a curious fact that, when one leaves the circle of automobile engineering and enters the larger realm of mechanical engineering in general, considerable criticism of the motor designer is encountered. The cynic in the larger sphere of engineering activity tells one that the tool-kit necessary for a small car is nearly as extensive numerically as the kit requisite to dismantle a locomotive or a large group of machinery in a power house. Whilst this may be an exaggeration, there is, nevertheless, a measure of truth underlying the charge. In some few cases manufacturers of cars have made efforts to simplify the tool outfit, but there is still room for considerable improvement.

It may be that in the motor Arcadia of the future, a self-respecting car will disdain anything in the nature of a tool equipment. We may be given a small shifting spanner so as to change the sparking plug, if such an accessory should ever dare to fail properly to function. As with any other subject which one may comment on, it must be admitted that criticism is easier than the work of proffering a practical solution. If one should endeavour either to standardise or materially to curtail the tool equipment, there are many difficulties confronting such ideals. Still it would be a bold spirit who would definitely declare that such a desideratum was unattainable.

THE CONTROLLING FACTOR.

At this point it is advisable to anticipate the obvious mental comment of the reader—namely, that in order to



THE VAUXHALL TOOL-KIT, UNDER THE RUNNING BOARD.

attain standardised tool equipment we must have standardised car fittings upon which the tools are to operate. As a matter of fact, this is really the only apparent difficulty attending a happy solution of the initial problem. If we can simplify and standardise nuts and bolts and sundry accessories on cars, it is at once practicable to attain the same ideal in the tool equipment. The engineering industry has already done much in the work of standardisation, and the motor trade has also done a great deal towards the ideal. The question is whether these efforts can be carried further with practicability.

Suppose, for example, we set out with the idea of definitely limiting the size of bolts, nuts, and studs to a variety not exceeding six. Suppose, further, that we also made a proviso that the head of every bolt should be self-holding against rotation in the same way as recently inaugurated in certain of the best aero-engines. We should then come down, so far as spanners were concerned, to a tool-kit limited to three of the double-ended variety.

We could bid a polite, if not altogether regretted, adieu to the shifting spanner, and to "foot-prints," or dogs as they are sometimes termed. We should also say good-bye to special types of spanners, as our imaginary car would also embody ready accessibility to every nut or stud. We should also bid a fond farewell—without any regrets whatsoever—to the unpleasant art of endeavouring to hold the head of a bolt with one spanner, whilst slackening off the nut with another. It is not for the mere critic, who may, indeed, plead ignorance of mechanism, to specify the standard sizes of bolts which should be employed. It would seem practicable however, to embody a list somewhat as follows:

$\frac{3}{16}$ ths, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{7}{16}$ ths, $\frac{1}{2}$ inch, and $\frac{5}{8}$ ths.

If the list named is not big enough, assume a bigger one, and make a choice for standardisation between the $\frac{7}{16}$ ths and $\frac{1}{2}$ in.; possibly $\frac{1}{2}$ in. might meet the bill!

THE WEIGHT QUESTION.

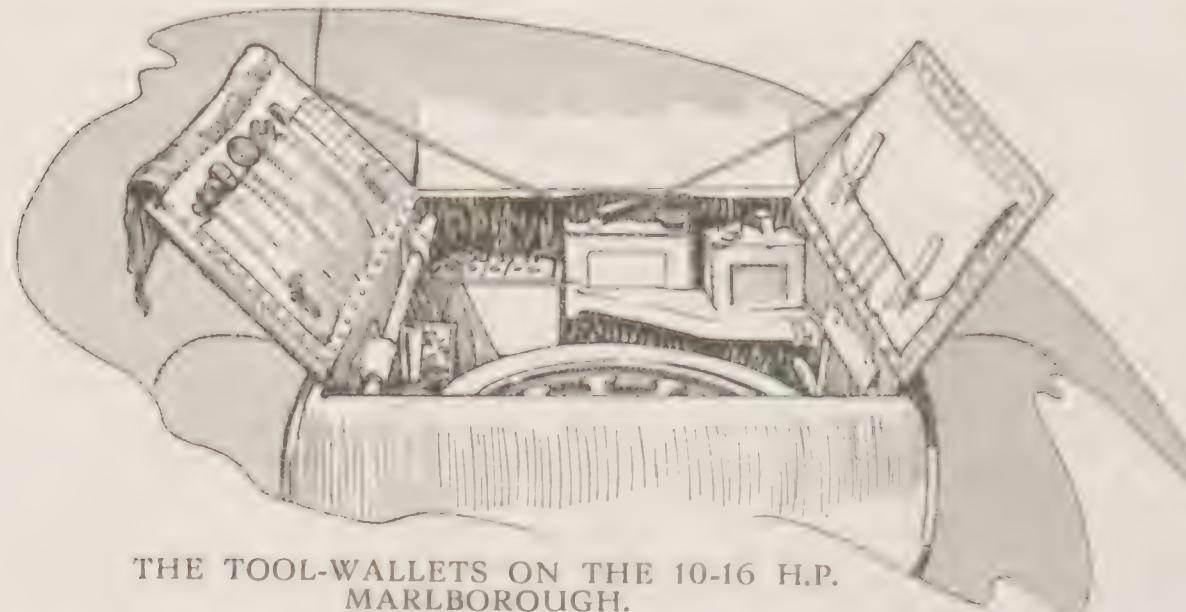
It might be argued that the weight question would be a counter consideration in endeavouring to attain this ideal. Possibly so. In cases where weight is an important consideration, and in the matter of using the smallest possible marginal factor of safety, the present-day designer generally



THE ROVER METHOD OF UTILISING A SIDE DOOR.

makes a $\frac{3}{8}$ bolt of exceptional quality do service equivalent to a normal fitting of, say, $\frac{1}{6}$ ths. On the other hand, if it should be argued that a larger bolt might be necessitated here and there, it must also be remembered that weight would be materially reduced in the tool-kit, to say nothing of the higher efficiency attained from the motor owner's point of view in the product as a whole.

The saving of minute portions of weight in a car is not of serious import except in relation to the reciprocating



THE TOOL-WALLETS ON THE 10-16 H.P.
MARLBOROUGH.

parts of the engine. We certainly do not want half-inch bolts in the big ends if we can have a proper margin of safety with $\frac{3}{8}$ ths. In certain engineering achievements the multitudinous saving of such minute weights is a factor of supreme importance. For example, it is recorded that weight economies in quite minor details rendered possible the building of the Dreadnought. Such a situation, however, does not obtain in a motor-car. There is no use in quibbling over such trifles, and putting them forward as a serious counter-consideration to the ideal of standardisation in car and tool equipment. It will also be a *sine qua non* with our imaginary standardised bolt, car, and tool equipment that the accessibility of nuts should be different from what it is now in many cases. The spanner should efficaciously embrace every nut or stud on the chassis, and have a radius of action with disengagement of not less than about 100 to 120 degrees.

Another consideration not definitely associated with the matter in dispute, but closely correlated to it, is the method by which we can most efficiently dispose of tools and spare parts which are needed on a car. Here again practice is widely divergent. Some cars are excellently adapted in this respect, and others leave room for very considerable improvement. The roll of tools looks very pretty in its initial state, but as every experienced motorist knows, it has a mysterious manner of gradually losing its pristine neatness and cleanliness. In this respect, one is pleased to refer to the new model Vauxhall cars, as the method for stowing away the tools etc., is remarkably neat, practicable, and clean. The illustration is self-explanatory.

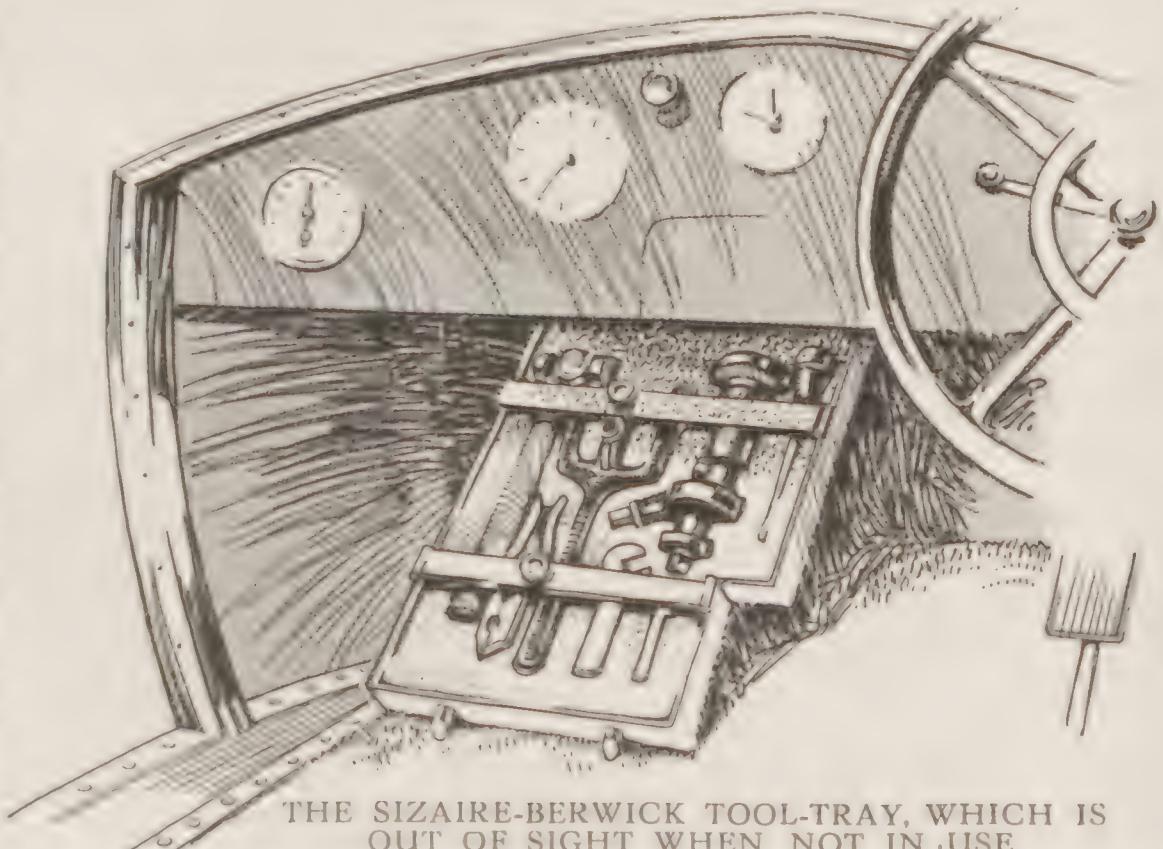
On the A.-C. car, also, the tools are placed beneath the near side running-board. The Rover method is to utilise one of the side doors as a tool cupboard, in the manner shown in our second illustration; the arrangement is neat and accessible alike. On the Marlborough two-seater the

hinged flaps of the rear portion of the body have each a fitted leather tool-wallet. Yet another interesting device is that employed on the Sizaire-Berwick car. The tools in this instance are contained in a hinged tray which ordinarily is concealed beneath the scuttle-dash, but when required for use can be instantaneously lowered to the footboard.

In all these instances the advantages conferred are twofold. The tools, in the first place, are in a definitely assigned position on the car, instead of being dumped at hazard in a well; and, in the second place, the boxes or leather receptacles are fitted in a methodical manner, whereas with the ordinary leather wallet, even though it may have sundry loops, the driver who is in a hurry to get going after a roadside repair generally drops his tools into the wallet in a bunch, hastily rolls it up, and trusts to the strap to keep things in their place.

The Tourist Trophy Races.

THE revival of the Tourist Trophy Races for motor-cars and motor-cycles is keenly anticipated by sporting motorists and motor-cyclists. It will be remembered that until 1914 these classic contests were held annually in the Isle of Man. It is gratifying to observe that the Manx people themselves are particularly desirous for the T.T. Races to be revived in 1920. The Royal Automobile Club has received a letter from the Town Clerk of Douglas, I.O.M., extending on behalf of the local council "a hearty



THE SIZAIRE-BERWICK TOOL-TRAY, WHICH IS OUT OF SIGHT WHEN NOT IN USE.

invitation to the R.A.C. and the A.C.U. to organise the T.T. motor and motor-cycle road races on the island next year, say, in the months of May or June." We understand that the R.A.C. has not yet arrived at a decision regarding the suggested revival of the Tourist Trophy in 1920, but the A.C.U., we are informed, has provisionally arranged for the Motor-cycle Tourist Trophy to take place in May next.

Buick

THERE are two standard Buick cars for 1920: Model KX. 45, a five-seater car, and Model KX. 44, a two-seater roadster.

The chassis are identical in all respects. The new chassis, though about three inches longer behind the dash, is lighter than its predecessor. Its R.A.C. rating is 27.3 h.p.

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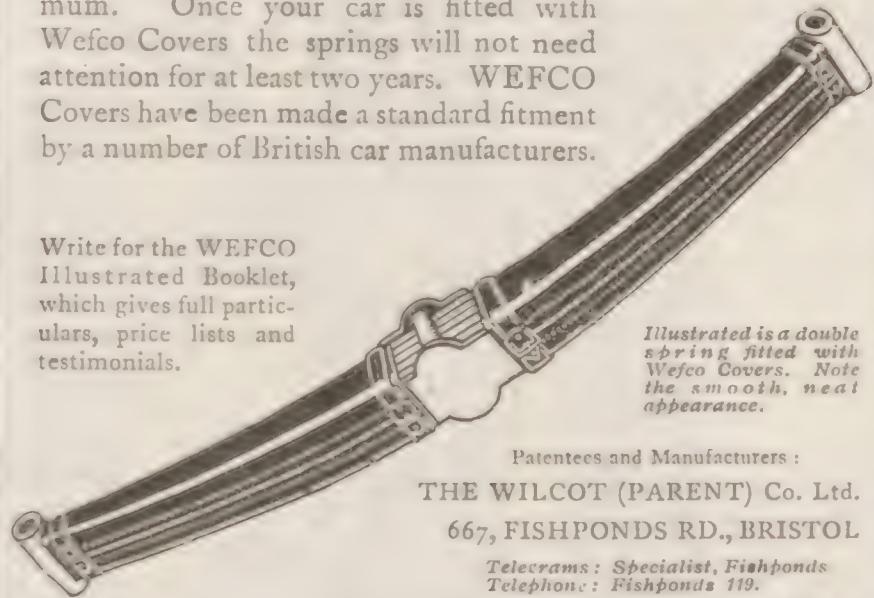
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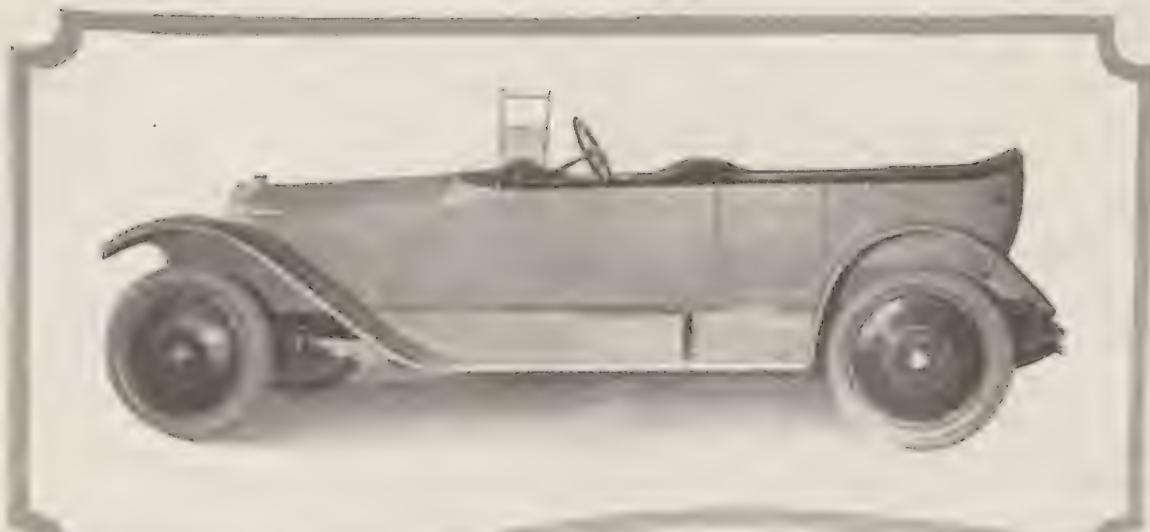
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SOME NEW FRENCH CARS.

THE blending of the lines of the bonnet with those of the scuttle dash, and of the lines of both with those of the body aft of the screen has been most successfully carried out in this Delahaye car. An interesting mechanical feature, which the illustration unfortunately does not show, is the enshrouding of the cooling fan, so that every atom of its energy shall be utilised.

A notable point in connection with the Vinot car shown here is that, although only the one model is made, it is specially designed so that the chassis may accommodate any required type of body. This end is attained by making the gear-change gate adjustable to a variety of angles, among other things. The car is of 15-20 h.p.



There is a distinct suggestion of the Sedan chair in the lines of this Delaunay-Belleville car—an idea in modern automobile coachwork which is popular across the "herring pond," although European designers of closed cars are more apt to favour the modified submarine type. Whatever may be the relative merits of the two ideas, this car certainly combines dignity and grace to an unusual degree. The chassis is of the 30-h.p., 6-cylinder Delaunay-Belleville type. A smaller "six," of 20-h.p., is also made.



One of the larger Panhard models for 1920. The makers are among the few—and these confined entirely to the Continent, as distinct from the British Isles—who believe, apparently, in a multiplicity of models. The general tendency, both at home and abroad, is to specialise on a single type of chassis, but Panhards appear in four different guises. They all possess very similar mechanical details, but the engines, all four-cylinder, are of 12-h.p., 14-h.p., 18-22 h.p. and 28 h.p., the two largest having the Knight type of slide valve. It is usually admitted that the Panhard-Knight is one of the neatest of slide-valve engines.



THE SUPER-SPORTING CAR: Is it a Good Investment? By W. HAROLD JOHNSON.

WELL before the war the term "light car" was common in motoring conversations, but it is only within the last few months that the genuine light car has materialised on anything like an extensive scale. And the light car of to-day is an entirely different type of vehicle from the "light car" of 1913, which, in fact, was often not a light car at all, but a really heavy one. It was a *small* car, and it did not weigh so much as the full-sized touring car; but that did not make it a light car, although it may have been called one.

Mere reduction in weight does not make a motor-car light unless it is effected without a reduction in engine power. Presumably it is reasonable to judge the points of a motor-car in regard to their effect on its road performance; if weight is reduced at the expense of road performance in any form, whether in connection with speed, hill-climbing, or comfort, then the reduction is not the good thing it ought to be. A car having a weight of 12½ cwt. and an engine power of 10 h.p. should be regarded as a heavier car than one having a weight of 16 cwt. and an engine power of 15.9; both ratios were common enough in pre-war days, but for some inexplicable reason the car that was merely small was called "light."

Lightness, as applied to motor-cars, is a term that should be understood as connoting a high power-to-weight ratio, and the touring car with a really high power-to-weight ratio is essentially a post-war product. It may be taken as a fairly safe rule that a power-to-weight ratio of 1 h.p. per cwt. is desirable for all-round satisfaction on a touring car; but it is important to bear in mind that, in arriving at the figures, it is the brake horse-power of the engine that should be considered and the weight of the car complete with body and equipment, though without passengers. The pre-war engine, rated at, say, 10 h.p., gave very little more than this on the brake, but the average 10 h.p. engine of to-day has a maximum output often coming very near to double the figure.

THE POWER-TO-WEIGHT RATIO.

Accompanying the increased output of an engine of a given size has also come a reduction in chassis weight for a given strength, and so there are two distinct tendencies now at work leading to the raising of the power-to-weight ratio of cars. By way of example, a few specimens may be quoted at random from among the exhibits at the last Olympia Show. The new Napier engine weighs 2 cwt. less than its predecessor and gives a 50 per cent. higher output; the Vauxhall 30-98 h.p. engine gives to the complete "Velox" car a power-to-weight ratio of over 4 h.p. per cwt.; the A.B.C. engine has a maximum power output of something like 36, while the complete car weighs less than 8 cwt.; the new G.W.K. four-seater car weighs 11 cwt. and its engine, having a nominal horse-power of 10, gives 22 on the brake.

All these cars are what I should call light cars, although this use of the word is obviously something quite different from that which is usually understood by the term. One might be pardoned for regarding the Daimler "Light Thirty" as anything but a light car, but its chassis weighs one ton and its engine gives 56 h.p. on the brake. Add another 10 cwt. for the body, and you have a car with a power-to-weight ratio of nearly 2 h.p. per cwt.

Briefly, the advantages conferred by a high power-to-

weight ratio are high speed and excellent hill-climbing from an engine of given size; or, conversely, for given speeds, excellent fuel consumption and minimum tyre wear. In other words, the result is economy, whether by economy be understood the maximum performance from a given expenditure or the minimum expenditure for a given performance.

THE OTHER SIDE OF THE CASE.

Candidly, I do not think that the objections applying to a high power-to-weight ratio car are likely to have much point in the cases of most of these vehicles I have mentioned, for they are first-class productions. Where the trouble begins is when the inexperienced or none-too-conscious maker realises the advantages of a high ratio, but does not realise the essential conditions of its successful application. The only sound method of reducing weight is to use lighter and better material, and less of it, but unfortunately weight *can* be reduced by using less material than previously without improving its quality. There are many ways of increasing engine-power output, but the most obvious is that of increasing the compression ratio, without any further modifications in material or design. I know a small car maker who adopted these tactics in pre-war days, with a certain measure of success on the track, but no one who knows anything about cars ever dreams of going to him with an order for a car for ordinary road work now.

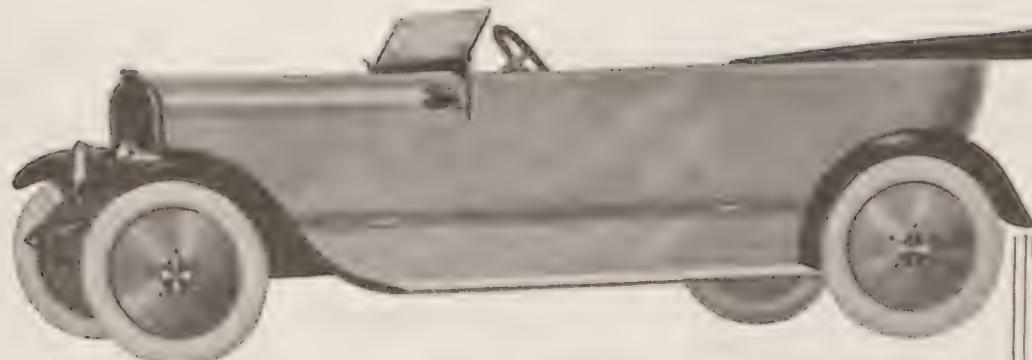
Several makers appear to have realised that to catch public attention they must be able to advertise a high power-to-weight ratio. What they have not realised is that, to be successful, the desideratum must be obtained by sound methods. The ignorant or unscrupulous designer will turn out a car that is sadly lacking in durability, and, because he thinks it ought to be fast, the unsuspecting owner will drive the car along a very short road to disaster.

THE "CULT OF THE SPORTING CAR."

The high-speed, highly-efficient engine is an excellent thing in the hands of the driver who understands it, but it is relatively delicate, and it is not likely to give the novice anything like the service obtainable from the old-fashioned but very reliable, solidly constructed, low-speed engine. It needs to be manufactured with more precision than is necessary for the low-efficiency engine, or it is apt to be "rough" in its running, and such matters as crank-shaft whip and minute errors of balancing increase in significance as the engine speed goes up.

Efforts to increase the power-to-weight ratio of a car often take the form of cutting to the absolute limit the body accommodation offered. There was at the Show a car of foreign manufacture having a wonderfully high-efficiency engine with a nominal horse-power of about ten. The body fitted was a miserable piece of work, in spite of the fact that the complete car was priced at little less than £1,000! It was an example of the "Cult of the Sporting Car," but if anyone ever derived any pleasure from riding in that body he must be a very easily satisfied person.

And so it is; the genuine high-efficiency or sporting car has attractions all its own; but, if they are to be obtained at the expense of durability and comfort, let us leave the sporting car to the man who wants nothing but an outlet for his superfluous cash.



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Contributions should be addressed to the Editor of "The Motor-Owner," 33, King Street, Covent Garden, London, W.C.2., and should be accompanied by a stamped, addressed

envelope. While every effort will be made to return them if unsuitable, the Editor cannot hold himself responsible in case of loss or damage.

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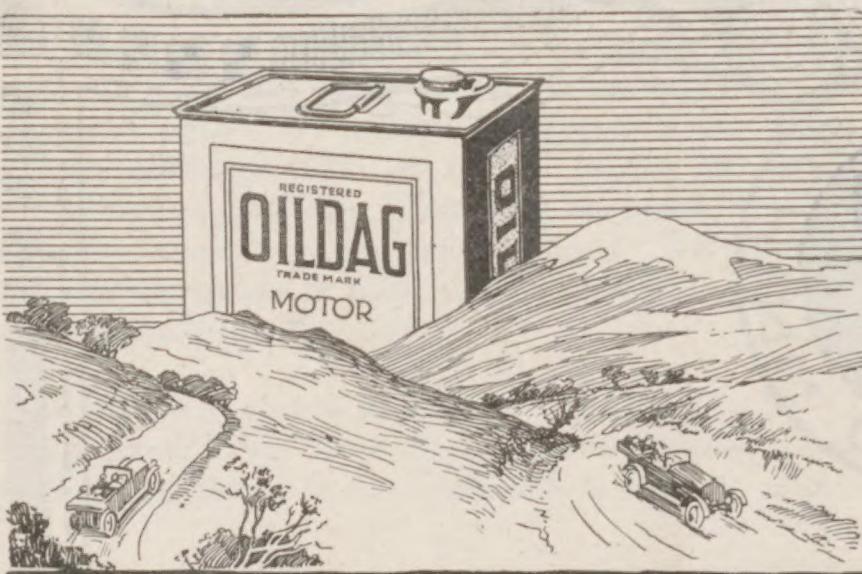
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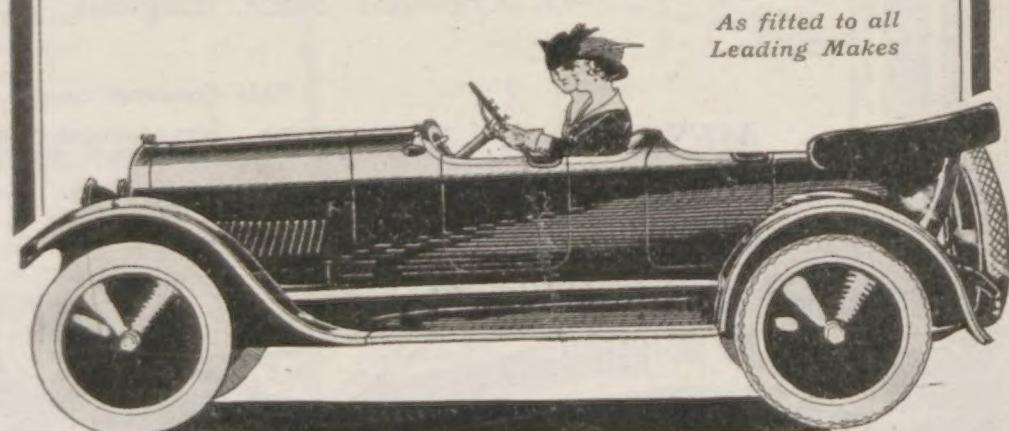
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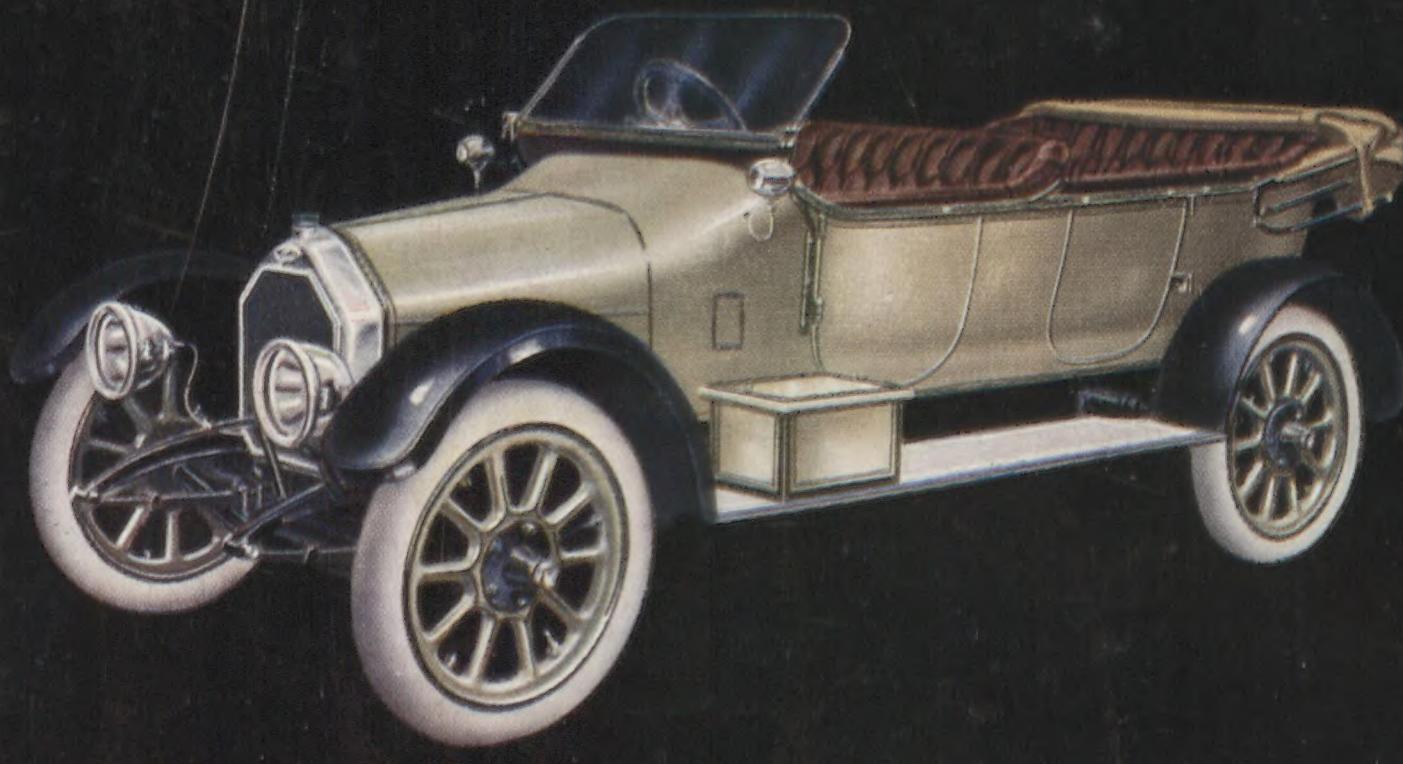
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